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Ontario

# Ministry of the Environment

## Annual Report

## 1975-76

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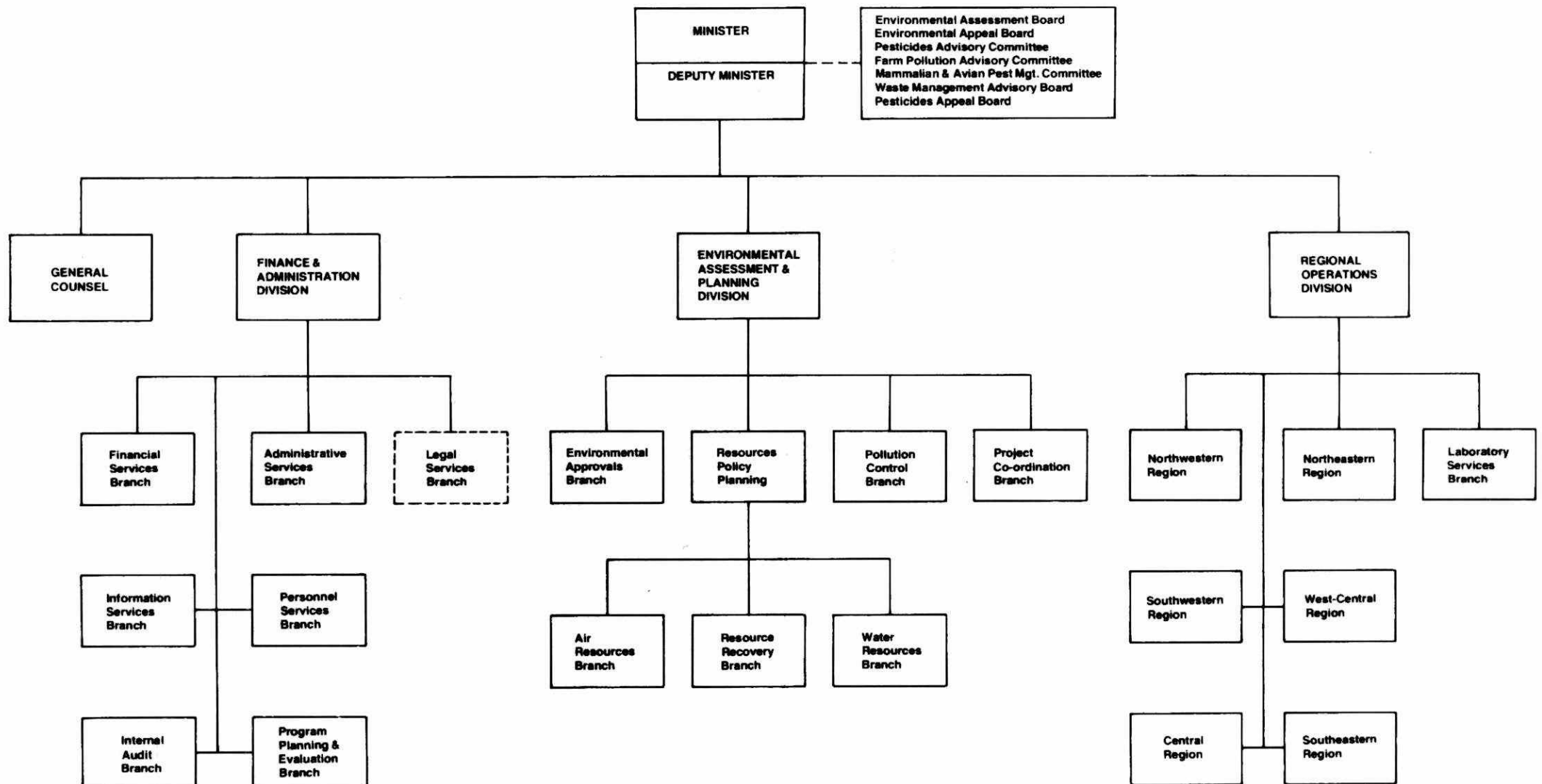
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# MINISTRY OF THE ENVIRONMENT



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To:

The Honourable  
George A. Kerr, Q.C., Minister.

Sir,

I have the honour to submit  
for your approval the 1975-76  
annual report of the  
Ministry of the Environment.

Respectfully submitted,

Everett Biggs  
Deputy Minister



To:

Her Honour,  
The Lieutenant-Governor  
of the Province of Ontario.

May it please Your Honour,

I have the privilege to present  
the annual report of the  
Ministry of the Environment  
for the fiscal year beginning  
April 1, 1975, and ending  
March 31, 1976.

Respectfully submitted,

George A. Kerr, Q.C.  
Minister

## goals, objectives and achievements 1975-76

To provide the people of Ontario with the highest level of environmental protection and management, the Ontario Ministry of the Environment has set four major, long-term objectives:

- . To control contaminant emission.
- . To establish environmental safeguards.
- . To manage Ontario's water resources and to manage waste.
- . To develop and maintain measures to restore and enhance the natural environment.

The Ministry is committed to providing efficient, economical services through a regional structure, established in 1974. This provides effective and direct service from six major bases and 23 district offices which serve as key delivery points for inspection and pollution abatement activities, local approvals and services and quick, effective action on pollution problems.

The Ministry enjoys a close working relationship with municipalities, and provides consultation and development services with regard to water management and pollution control. As part of this tradition of service, the Ministry operates more than 175 sewage treatment plants and 100 water treatment plants, a provincial initiative which has had a significant effect on environmental quality and on community development across Ontario.

## 1975-76 achievements

During 1975-76 the Ministry advanced toward its goals and objectives on many fronts. Major activities and achievements are outlined throughout this annual report by Divisions and Operating Branches, and include:

- Progress in research, surveillance and monitoring to clean up pollution of the Great Lakes under the Canada-Ontario and the Canada-United States Great Lakes Water Quality Agreements;
- Progress in air monitoring techniques and substantial air quality improvement;

- Construction of water and sewage facilities, including completion of 14 municipal water works and 34 municipal sewage works and extensive planning for future facilities;
- Expansion of the Ministry's laboratories and services, including the addition of new scientific equipment and research facilities to improve capabilities in the detection, analysis and control of environmental contamination;
- Extensive surveys and monitoring of water quality in Ontario's inland recreational lakes and watersheds;
- Construction of a unique Experimental Resource Recovery Plant for treatment of solid wastes;
- Advances in systems development for improved management and planning of capital and operating programs;
- Preparation of a Model Municipal Noise Control Bylaw for the use of municipalities;
- Enactment of The Environmental Assessment Act, designed to prevent pollution at the conceptual stage of major projects;
- Consolidation of regional and district offices and staff in the Ministry's program of decentralized services.

## great lakes clean-up

Ontario has played a lead role in cleaning up the Great Lakes. Phosphorus control, developed extensively in Ontario, is in effect on every sewage treatment plant in Southern Ontario which discharges more than a million gallons a day into the Great Lakes. The long-term effects of Ontario's program and revitalized action in the U.S., offer great promise for a healthier Great Lakes system.

The original five-year Canada-Ontario Agreement on Great Lakes Water Quality which expired December 31, 1975, was renewed in March 1976 to extend to 1980, with extensive studies being undertaken on the effects of waste discharges and land use activities on water quality in the Great Lakes. The original Canada-United States Agreement of 1972 is scheduled to be renewed in 1977.

## industrial wastes

Ontario has achieved minimum national levels of control over industrial wastes and is now working to improve waste treatment to meet local water quality needs.

The International Joint Commission identified 28 major industrial polluters in Ontario including several corporate members of the pulp and paper industry. A series of control programs are being developed with this industry and a more aggressive approach is being taken in the prosecution of violators.

In addition to controlling direct discharges from industry, Ontario is working with municipalities to improve the hidden pollution which comes through industrial discharge into municipal sewage collection and treatment facilities. Some new approaches are also being developed to provide safer transportation and ultimate disposal of hazardous liquid industrial wastes.

## industrial air pollution

An established and comprehensive system of air pollution monitoring and abatement has resulted in Ontario industry spending or committing over \$1 billion for air pollution control with consequent substantial air quality improvements in Hamilton, Toronto, Sarnia, Sudbury and many other communities across Ontario. The air pollution index, which provides an effective alarm and action program to meet temporary concentrations of air pollution, is now in operation in Toronto, Hamilton, Sudbury, Windsor, Welland, Niagara Falls and Coniston.

## exotic contaminants

The increasing sophistication in detecting and monitoring trace contaminants and the advance of medical knowledge are opening new areas of environmental concern.

Here, and around the world, exotic contaminants such as mercury, lead, asbestos, polychlorinated biphenyls (PCBs), Mirex and other chemical compounds are surfacing as potential hazards to human health. This has led to closer ties between environmental and health considerations and new thrusts in pollution study and control.

Substantial gains have been made in controlling mercury and lead discharges. More pervasive contaminants, such as PCBs, are being addressed on a number of fronts with monitoring programs, source identification, and new policies. A hazardous contaminants program has been developed to concentrate our resources on monitoring and abating the most significant hazards among these exotic contaminants.

## waste management

The new thrust in waste management is the reduction of waste through policies which discourage the proliferation of waste products and through imaginative and comprehensive work on reclaiming material and energy resources from waste.

A board of citizens, the Waste Management Advisory Board, has been established to assist in the development of these policies and programs.

A new soft drink container regulation will guarantee the availability and encourage the use of refillables, without causing economic shock to the industry or confusion to the consumer.

The Ministry's resource recovery program, to develop facilities to reclaim material and energy resources, is under way, with the new Experimental Plant for Resource Recovery opening in 1977 as the world's first fully instrumented and comprehensive research facility to process waste and produce hard data on which we can develop large-scale waste reclamation and marketing.

Refuse-derived fuel will be used in a cement kiln study and through our "Watts from Waste" plant in Lakeview Generating Station, Etobicoke.

We are involved in a study in Windsor assessing a new type of container and collection system which has great potential for reducing garbage collection costs.

We are also financing a number of area waste management studies to improve waste management systems and determine the suitability of resource recovery plants in communities like Sudbury, Halton, Windsor, London and Hamilton, among others, and the proper timing for any development of the facilities.

## environmental assessment

The Environmental Assessment Act, enacted in July 1975, will ensure that public and eventually private projects are kept in tune with environmental planning policy. The Environmental Assessment Board has been established (April 20, 1976) to maintain the environmental hearing functions required by the Ministry and to deal, under the new Act, with any environmental assessments referred to it by the Minister.

The first regulations to implement this new legislation are now in force with regard to Ontario Government projects. The Act will not extend to municipal or industrial projects, except on a voluntary or designated basis, until we have acquired some experience with this new approach to planning.

## servicing development

The Ministry of the Environment has a traditional role in development in Ontario inherited with the responsibilities it assumed from the former Ontario Water Resources Commission. Consistent with this tradition, nearly seven million people in Ontario are now served through 457 waterworks in the Province, operated either by municipalities or the Ministry.

In addition, communal sewage facilities have been extended to 5.4 million people.

## capital construction

A capital budget allocation of \$155.2 million in 1975-76 provided for expenditures on engineering, construction and property acquisition associated with water and sewage projects across the Province. As at April 1, 1976, 436 projects were under active development, including 359 provincial projects and 77 municipal. In the latter, the Ministry provides financing for a maximum term of 30 years with ownership reverting to the municipality upon repayment. Under the provincial type program, the Province retains ownership of the works as provincial assets and costs are recovered on the basis of water or sewage service rates.

In recent years the Ministry's construction program has grown to the point where approximately 30 per cent of the total annual expenditure for water and sewage facilities in the Province is for Ministry-financed works. In Ontario there are 435 municipalities which are being serviced by communal water and/or sewage works. The Ministry has been, or currently is, involved in 368 projects, entailing 85 per cent of these municipalities.

Despite these achievements, however, there is still a substantial demand for new capital commitments from the Ministry. Outstanding requests for services have now reached the billion dollar mark and there is no immediate or easy solution in view. The pace of development and growth in Ontario is a dominating influence in this demand.

In a period of fiscal constraints, when the Ministry is unable to proceed with every request for funding, the Ministry has formulated a "Management By Results" (MBR) system to establish priority of projects.

An MBR assessment system is utilized to evaluate proposed projects in terms of their contribution to achieve, in the following order of importance: the removal of health hazards, environmental protection, accommodation of growth, and community enhancement. Briefly, projects are reviewed on the basis of these objectives and are graded 1 through 5, with a minimum score being required before a project is accepted. However, a special project class can supplement an MBR ranking to allow for continuity of projects and recognition of government objectives.

## looking forward

- . The Ministry has developed and implemented a more direct and efficient structure to provide service on a local basis. We intend to continue improving the level of service provided as we gain experience in this structure.
- . We intend to continue expanding our knowledge and understanding of environmental contamination, our measurement and assessment methods, and our environmental protection and restoration systems.
- . We now have the instrument, in the form of The Environmental Assessment Act, to do a better job of forestalling undesirable environmental effects.
- . We are on the threshold of a new and exciting approach to waste management, which combines the reduction of waste, through measures such as the soft drink container regulations, with a program to develop the technology, facilities and markets for large-scale reclamation of material and energy resources from garbage.
- . And finally, we have a traditional role in providing essential water and sewage services, both for environmental protection and for development. Rising capital construction costs, increasing pressures from growth and development and public demand for a high level of environmental service make it increasingly expensive to maintain this traditional role. The challenge here is to work out an approach to servicing which will meet both environmental and growth needs at a cost the Province of Ontario can afford.

# environmental assessment and planning division

Assistant Deputy Minister: Kenneth H. Sharpe  
Executive Director: W.B. Drowley

This Division has three major responsibilities which provide a scientific base for many of the Ministry's policies and activities:

- To serve as a central approval and co-ordinating agency for applications involving the design, construction and operation of water, sewage, solid waste reclamation and recycling plants and waste disposal sites required under Ontario legislation;
- To conduct scientific and technical research, assessment and pollution control programs involving the use of water, land and air resources, the environmental implications of realty development and the control of all forms of pollutants;
- And to provide technical and supervisory services required in the planning, construction and operation of water and sewage treatment plants, solid waste and resource recovery facilities.



## air resources branch

The main thrust of the Air Resources Branch program is to keep the Ministry in the forefront of the ever-advancing technology of air pollution and its control, and to recommend the reflection of this knowledge in new air management policy and legislation. At the same time the wide scope of routine monitoring and surveillance of air quality, vegetation damage, automobile and stack emissions must be maintained and improved where technology and resources permit. 1975-76 saw considerable expansion in both these major areas of the Branch's endeavor. All sections of the Branch participate in the development of criteria for use in regulations.

### Technology Development & Appraisal Section

In 1975, a Hazardous Contaminants Group was set up in this Section to anticipate as well as to react to new knowledge of the environmental effects of an array of chemicals. This Group, working with our field crews on the special monitoring vans, develops methods of detecting these pollutants from which commercial equipment is usually not readily available.

The Technology Group keep the Branch abreast of the process of our complex industrial plants to assess emissions of air pollutants from these sources and to maintain current knowledge on control methods available to industry. Energy related industry, PCB's application processes, vinyl chloride and poly-vinyl chloride technology, asbestos using industry, and industries such as abrasive, steel, non-ferrous metals, pulp and paper have been investigated.

Some 35 compliance tests have been performed in Ontario and witnessed by the Source Testing Unit. New sampling methods have been developed for many of them: sulphuric acid, PCB's, arsenic, asbestos, total hydrocarbons. A comprehensive emission inventory of lead was conducted and results published during the year.

The Monitoring and Instrumentation Development Unit completed a comprehensive survey in the Northeastern Region, where most of the major sources were under surveillance for several weeks. Other surveys performed included VCM in Welland; asbestos Province-wide; PAH in Sault Ste. Marie, and mercury in Cornwall.

Four seminars related to the Research Grants Program were held in February 1975, one in Sudbury, the remainder in Toronto. A large number of proposals for grants were evaluated with 22 being subsequently funded. The progress of investigators was monitored by the Unit staff. A booklet describing the Research Grants Program was prepared and distributed to universities throughout the Province.

### Phytotoxicology Section

While carrying on an extensive and growing assessment of air pollution effects on soil and vegetation, the members of the Phytotoxicology Section attended 18 workshops and seminars to maintain this Ministry in the forefront of phytotoxicology technology. Sixteen papers on studies and effects were presented by the Section in the U.S. and Canada, and four were published in technical journals.

Two hundred and forty-nine complaints concerning vegetation and soil pollution were received from the public. Seventy per cent of these complaints were confirmed and reflected the widespread use of chemicals in our society -- such as lead, boron, sodium chloride, sodium hydroxide, etc., and side effects such as salt spray and ozone. Reports confirming contaminant diagnosis were forwarded to the Board of Negotiation for settlements of damage claims.

Agricultural surveys indicated varying degrees of ozone damage on approximately one million acres of white beans. Damage was improved over 1973 but worse than 1974. Damage to tomato crops from peroxyacetyl nitrate (PAN) was less severe in 1975 than in the previous three years.

Pre-operational vegetation base line studies in the Nanticoke area indicated no adverse effects from the coal-burning operations of Ontario Hydro. Indicator plots of vegetation sensitive to ethylene and oxidants were established in the vicinity of Sarnia to anticipate start-up of low density polyethylene plants in that area.

### Automotive Section

This Section maintained its routine spotchecks of the emissions of some 10,600 cars in order to maintain a running evaluation of the automobile's contribution to air pollution and to enforce the requirement that control devices are not tampered

with. This included spotchecks at 11 municipalities during the summer months. Inspection of vehicles on used-car lots is used to enforce the replacement of pollution control devices on vehicles being offered for sale. In this program, 1,210 cars were checked at 138 dealerships.

Investigations were undertaken to provide background data on several topics. These were:

- (1) Effect of air filter on vehicle tailpipe emissions
- (2) Vehicle fuel consumption during idling
- (3) Evaluation of multiple spark discharge unit

Automotive inspectors make regular Highway patrols with the O.P.P. to enforce the visual emissions aspect of exhaust from trucks. This has resulted in 374 charges and 316 convictions under The Highway Traffic Act.

#### Air Quality & Meteorology Section

At present Ontario's air quality monitoring network consists of over 1100 instruments. This network produces over 2½ million data points to be validated, correlated and interpreted by the professional and technical staff of this Section. In addition, many of these instruments are connected into the Toronto computer which produces the Air Pollution Index readings for eight industrial centres in Ontario. In 1975, New Sudbury and Coniston were added to the Index network which is used to alert Ministry control officials, the public and industry when adverse weather conditions may make it necessary to cut back the emissions of air pollutants.

The Air Quality & Meteorology Section produced air quality simulations to test the abatement strategies on community planning studies for several urban areas including Toronto, Sarnia and Etobicoke. A computer simulation model to predict the scavenging of air pollutants from the atmosphere has been developed.

#### Criteria Development & Program Planning Section

This Section co-ordinates the input of all of the other sections into the production of regulations or other legislation. In the past year, 17 new standards for air contaminants were added to the growing list of chemicals in Ontario's regulations.

Working closely with the Ministry of Health, a new procedure was developed for the production of air quality standards which ensures a more comprehensive study and evaluation of all pertinent factors. The procedure was expanded to include a review of proposed standards by the Occupational and Environmental Health Advisory Council.

## water resources branch

The Water Resources Branch continued to provide water management services, studies and criteria on behalf of the Ministry, its regional offices, other ministries and municipalities in order to protect and preserve water resources throughout the Province.

#### Great Lakes

The importance of a strong surveillance program in the campaign to clean up the Great Lakes was recognized in a new five-year agreement between Canada and Ontario, signed in March 1976. In the first year of the Agreement, Canada has agreed to pay a maximum of \$762,500 in matching funds to the Province for its surveillance program during 1976-77.

Investigations carried out during the year included assessments of the impact of the Grand River on Lake Erie and the Thames River on Lake St. Clair, identification of the extent and sources of bacterial degradation in the Detroit River, and assessment of the impact of industrial discharges at Brockville and Maitland on water quality and biota of the St. Lawrence River. Continued monitoring of mercury concentrations in sediments of the St. Clair River and Lake St. Clair confirmed the trend to decreasing levels.

Results of a nine-year study of data from intakes withdrawing water from Lake Erie's western basin indicate that algal levels have decreased markedly every year since 1971. The decrease coincides with joint Canadian and U.S. efforts to reduce phosphorus input to Lake Erie and Lake Ontario. Similar long-term studies of algae are under way at other selected locations on the Great Lakes. The Lake Erie findings represent the first documentation of "recovery" in Lake Erie, and provide valuable evidence for the effectiveness of legislation limiting phosphate levels in laundry detergents and of phosphorus removal at sewage treatment plants within the Great Lakes basin.



A water quality survey covering the effects of artificial mixing by aeration was performed in Hamilton Harbour during 1975. Dissolved oxygen increased in the deeper harbour waters and remained normal in the surface waters. There was a decline in ammonia levels resulting in an expansion of the vertical habitat for biota. Sources and sinks of oxygen were studied, with emphasis on sediment uptake which was determined to be important in oxygen losses from the harbour. Surveys were initiated to determine what effects zinc has on the harbour environment. It was apparent that artificial mixing increased the rates at which wastes became stabilized.

A review of all available information on water quality, water movement, sediment quality, sediment transport, aquatic biology, and waste inputs in the Central Toronto Waterfront area was undertaken on behalf of the Central Waterfront Planning Committee. A comprehensive report outlining the major issues surrounding water quality and water use in the area, recommending measures for enhancing quality, and pointing out further information needs, was published by the Planning Committee in January 1976.

Field programs for the collection of data on existing water quality and the identification of impairment in Lakes Huron and Superior and in the St. Mary's River were completed. Staff continued in the major task of synthesizing this information with data collected since 1973, and completed contributions to data on the near-shore water quality, exchange processes, and land drainage and tributary loadings for inclusion in the report of the Upper Lakes Reference Group to the International Joint Commission. This study confirmed that the main bodies of both lakes and much of the near-shore zone are of high quality. It identified several locations close to developed areas where water quality is degraded or where potential problems exist, and resulted in recommendations to overcome the problems and preserve high quality in the lakes.

Policy guidelines were developed to control heated effluent discharges to the Great Lakes. The guidelines relate to allowable discharge temperatures, temperature differences, methods of withdrawal and disposal, contaminants in discharge waters, alternative cooling facilities and circulation patterns.

#### Kawartha Lakes

In the Kawartha Lakes system, mechanical harvesting of aquatic plants and the assessment of the environmental effects

of large-scale vegetation removal were continued in southern Chemung Lake in 1975. A total of 734 acres was harvested, resulting in the removal of 3,325 tons of vegetation. The plants contained 13,200 lbs. of nitrogen and 1,245 lbs. of phosphorus. The latter value was equivalent to about half of the annual phosphorus loading to the southern part of the lake. No detrimental environmental effects on algae populations, plant communities, or the fisheries were observed from the harvesting operation.

#### Lake Simcoe

A five-year study of the water resources of the Lake Simcoe basin was completed and a report entitled "Lake Simcoe Basin - A Water Quality and Use Study" published. The results of the 1971-75 investigations show that water quality conditions in the lake are generally satisfactory and quite suitable for recreational activities, water supply and other common uses. There are, however, indications such as algal scums, increasing attached algal growth and an apparent stress on the cold water fishery which suggest that natural causes and man's increasing activity in the basin are resulting in long-term water quality changes.

#### Artificial Mixing in Small Lakes

Artificially-induced destratification was carried out in two highly eutrophic southern Ontario Kettle Lakes for the purpose of increasing oxygen levels in bottom waters, improving water quality, altering the species composition and numbers of algae, and restoring the fisheries and recreational amenities of the lakes. Shore-based compressors were used to pump air through a diffuser line into the deepest portions of the lakes. The aeration of Thompson Lake was initiated in late 1971. To date, changes in water quality and phytoplankton populations have been extremely variable. However, since 1973 rainbow trout have been stocked annually and appear to be thriving. Aeration in Heart Lake, a heavily used recreational lake, was commenced in July 1975. Although some early improvements in water quality were apparent, the lake had a rapid succession of blue-green algal blooms throughout the summer. Considerable effort is still required to fully understand the changes which can occur in nutrient-rich lakes as a result of artificial mixing.

## Sudbury Area Lakes

Experiments on both large and small lakes in the Sudbury area demonstrated the effectiveness of adding lime as a tool to establish and maintain near neutral water conditions in lakes subjected to acid input. Liming has changed lake plant communities beneficially to those more typical of unstressed lakes. Experimental additions of phosphorus to treated lakes resulted in an increased rate of biological recovery and a potentially increased food supply for fish.

## Grand River Basin Water Management Study

A broad range of water resource investigations were carried out in the Grand River basin, in co-operation with the Ministry of Natural Resources and the Grand River Conservation Authority. Analyses of the waste assimilation capacities of the Speed River downstream from Guelph and the central Grand River from Waterloo through Cambridge were undertaken to provide updated waste loading guidelines for sewage treatment plants serving Guelph, Waterloo, Kitchener, and Cambridge. Effluent dispersion studies carried out below major sewage treatment plant outfalls showed that complete mixing of effluent and river water occurred within three to five miles of the outfall. Streamflow analyses were conducted to evaluate low flow augmentation under various operating plans for the Belwood, Conestogo and Guelph reservoirs and to predict the impact on streamflow and water quality of constructing municipal wells next to the Grand River. This latter study was carried out in conjunction with extensive ground water supply investigations undertaken by the Regional Municipality of Waterloo.

## Thames River Basin Water Management Study

The Thames River Basin Water Management Study, undertaken jointly with the Ministry of Natural Resources, was completed with the publication of the main report, a summary report and the first two in a series of technical reports. The conclusions and 29 recommendations of the main report are addressed primarily to proposed solutions to water quality impairment and flooding, the primary water management problems in the basin. The study established the capacities of water resources to support various uses and defined a series of options for planning and management decisions.

## Water Resources Inventories

A report on the water resources in the Moira River basin was published. Results of the study indicated an uneven distribution of water resources in the basin, necessitating careful management in order to overcome problems of flooding during the spring and inadequate supplies in the summer. A similar water resources inventory study was on-going during the year in the Duffins Creek and Rouge River basins and another study was commenced in the South Nation River basin.

The publication "Water Well Records for Ontario", Bulletin 2-12, was released, showing ground water and geologic data for Northumberland, Durham and Victoria Counties. Three publications providing valuable surface water information were also released: "Selected Streamflow Data for Southern Ontario, 1974", "Map 3005-2, Low Flow Characteristics of Streams in Southwestern Ontario" and "Data for Northern Ontario Water Resources Studies, 1972-73".

## Engineering and Scientific Services

Work continued to identify acceptable controls for activities that can cause ground water contamination.

Geophysical surveys using seismic and electrical resistivity methods were carried out in several areas in support of Ministry ground water development projects. Ground water contamination also was investigated using electrical resistivity techniques.

The soils laboratory continued to conduct a variety of analyses on soil samples from various sources within the Ministry, the majority being analyses of the physical properties of sediments submitted by the PLUARG program.

River quality models were operated in support of Regional programs to set effluent waste-loading guidelines for Upper Junction Creek in the Regional Municipality of Sudbury and for the Saugeen River, downstream of the Town of Hanover. A workshop was held for Ministry staff to provide familiarization and training in the use of computer models in waste assimilation analysis.

The capacity for bioassays was increased for the Ministry's industrial wastes monitoring program, and field stations were

operated at Red Rock on Lake Superior and at Sudbury. The Red Rock program established the relationship between the acute toxicity of a pulp mill effluent to fish and the sublethal concentration which reduced growth or tainted flesh of fish. The Sudbury operation determined the contribution of low pH to copper toxicity in fish reproduction. Spottail shiners from eleven near-shore collection sites on Lakes Ontario, Erie and St. Clair were analysed for organochlorine residues. Higher PCB residue levels in flesh were found in areas of high industrial activity.

## **pollution control branch**

### POLICY AND PROGRAM DEVELOPMENT GROUP

#### Municipal and Private Section

A broad range of activities continued on the Great Lakes "clean-up" under the International Joint Commission (IJC) on Great Lakes Water Quality.

The Ontario and federal government partnership under the Canada-Ontario Agreement on Great Lakes Water Quality has grown and considerably enlarged its joint commitments as both governments have worked together in responding to the IJC recommendations. The research and information interchange, planning strategy and co-operative commitments between Ontario and the eight American states that border on the Great Lakes have been vitally rewarding to all jurisdictions concerned. This interchange with our neighbors has cemented a close and invaluable partnership among the 12 federal, state and provincial governments since the Canada-U.S. Agreement on Great Lakes Water Quality was signed in 1972. It has meant an interchange of all manner of scientific research and technological knowledge on all aspects of environmental care and protection that goes far beyond immediate matters pertaining to the Great Lakes.

All units of the Municipal and Private Section continued to participate in the activities of the IJC Pollution from Land Use Activities Reference Group (PLUARG) by providing services on task forces.

The Solid Waste Unit is co-ordinating PLUARG studies to determine the effects of processed organic waste disposal and

sanitary landfill sites on Great Lakes Water Quality. Both studies involve the collection of field data, determination of contaminant migration, and their application to the Great Lakes Drainage Basin.

The Private Sewage Unit, through representation on the U.S. Committee for on-site sewage disposal set up by the Board of States Sanitary Engineers for the States bordering on the Great Lakes and Upper Mississippi, participated in developing disposal standards in these ten American states.

The Municipal Sewage Unit is responsible under the Canada-Ontario Agreement for identifying and quantifying waste from Ontario municipalities discharging into the Great Lakes. All the waste loadings, together with the planned remedial programs and abatement status of Ontario municipalities discharging into the Lakes are reported yearly through the Water Quality Board Annual Report. In addition, this Unit participates in the special IJC Upper Lakes Reference Group study to assess the pollution problems in Lake Huron and Superior. Volume I (Summary and Recommendations) of the study has been published.

The first five-year term of the Canada-Ontario Agreement ended in December 1975. Under this Agreement, \$6 million was spent in research and development of efficient and economical waste treatment processes, including the treatability studies of phosphorus removal at all significant municipal sources in Ontario. By the end of the fiscal year, 168 sewage treatment plants were undertaking phosphorus removal on schedule, with a total of 183 plants expected to be in operation by the end of 1976.

Under the newly negotiated four-year term of the Canada-Ontario Agreement, signed in March 1976, approximately \$4 million will be provided over the next two fiscal years for continued research and development of waste treatment processes, and for surveillance of water quality near the Canadian shoreline of the Great Lakes.

The Infrastructure Agreement between Central Mortgage and Housing Corporation and the Ministry was signed in September 1975, scheduled to run through to December 1977. Over this three-year period an estimated \$550 million will be provided in loans and grants for the construction of sewage and water works facilities, storm sewer systems as well as for the planning of these facilities on a regional basis.

During the fiscal year, an additional 15 municipal water works and 27 municipal sewage works began operations.

On March 31, 1976, the total number of municipal water works in the Province stood at 457 with a total capacity of approximately 1.8 billion Imperial gallons per day. The number of municipal sewage works totaled 337 with a total capacity of approximately 1 billion Imperial gallons per day.

A revision of the regulations for septic and holding tanks was initiated during the year, subsequent to the publication of a Canadian Standards Association report.

"Project Remove", the derelict motor vehicle hulk clean-up program, was carried out in 18 municipalities, most located in northern Ontario. Contracts were established between the Ministry and municipalities whereby the Ministry initially pays for establishing the local program of locating, collecting and delivering derelict vehicles to certified salvage sites. Revenue from the sale of hulks remains with the municipality for further clean-up efforts. By March 31, 1976, some 11,657 hulks were located, 8,886 were released by owners and 5,875 were delivered to certified sites.

#### Industrial Section

This Section continued to develop effective industrial pollution control programs and criteria, and to provide technical support to the Ministry's Regional Operations.

The problem of liquid industrial waste disposal remained a high priority with the Industrial Section. With the co-operation of the liquid waste haulers, a voluntary way-bill system for the control of liquid industrial waste haulage and disposal was put into effect in January 1976. Preliminary statistics obtained from the system's first three months of operation confirmed an estimated 40 million gallons per year of liquid industrial wastes required disposal.

The following industrial guidelines were issued during the year:

- Environmental Design Considerations for Ontario Mining Operations;
- Tailings Disposal, Recommendations for Site Selection;
- Country Feed and Grain Elevators.

The following guidelines are under preparation or revision:

- Effluent Guidelines and Receiving Water Quality Objectives for the Mining Industry;
- Terminal Grain Elevators;
- Small Abattoirs;
- Wood Waste Disposal;
- Saw Mills and Board Mills;
- Industrial Discharges of Phosphorus;
- Petroleum Refining;
- Petroleum Bulk Terminals;
- Agricultural Code of Practice.

Staff participated in a number of federal task forces, both air and water, associated with the federal program for the development of regulations or guidelines for industrial air emissions or effluent discharges. The Section's three units -- Mining and Metallurgy, Chemical and Petroleum, and Food and Forest -- continued to maintain close contacts with trade associations in order to ensure that Ministry policies and programs are made available to individual association member industries.

#### Pesticides Control Section

The Pesticides Control Section continued to license exterminators and vendors, to issue new technical guidelines, and provide training courses for exterminators.

During 1975-76, termite and mosquito control programs were stepped up throughout the Province.

Termites have been found in at least 15 urban municipalities in Ontario, including all six municipalities in Metropolitan Toronto. During the summer of 1975, the Section initiated a detailed survey of possible termite areas, with the intention of eventually mapping all termite-infested areas in the Province.

During the year, surveillance of mosquito breeding sites was undertaken, and a report compiled indicating types and timing of insecticide applications, results, and monitoring of residues. When an epidemic of St. Louis encephalitis developed in Windsor during September 1975, the Ministry was called on and assisted in evaluation of what emergency operations should be undertaken and provided technical information to the city's



Medical Officer of Health. Guidelines for municipal abatement programs and technical information on pest species, registered insecticides and evaluation procedures were prepared and circulated to areas concerned.

#### Noise Pollution Control Section

The Environmental Protection Amendment Act, 1974 (No. 2) was proclaimed on October 8, 1975, thereby amending The Environmental Protection Act, 1971 to permit municipalities to adopt a noise bylaw under the provisions of the Act.

A Model Municipal Noise Control Bylaw was prepared for the use of municipalities. This bylaw can be adopted in whole, or in part, as required. This model bylaw was revised early in 1976, and includes a number of technical publications which effectively become guidelines for sound and vibration control under the provincial legislation.

As a result of rapid advances in solid state electronic technology, sound measuring monitors recently acquired by the Ministry and deployed in the field for noise investigations have resulted in significant improvements in the assessing of noise impacts on new subdivisions and residential areas. In all, 150 subdivisions seriously affected by noise were assessed on behalf of the Ministry of Housing. On the recommendation of this Ministry, appropriate noise control measures are now being required of developers of all new housing.

#### Contingency Planning Section

This Section published "The Province of Ontario Contingency Plan for Spills of Oil and Other Hazardous Materials" and two publications supplemented this manual. The contingency plan is intended to organize the activities of the various government agencies which may be involved in a spill incident of major proportions, and provides a command structure as well as establishing a method of operation for the forces engaged in dealing with a major pollution incident. The Ontario spill contingency plan also fulfills the requirement which under Order-in-Council 1487/75 approved May 28, 1975, assigns this Ministry the task to co-ordinate the response of the Government of Ontario to emergency situations which may arise from spills of chemicals, oil, or other contaminants.

The Section encouraged and assisted several larger municipi-

palities in their efforts to prepare municipal spill contingency plans. Such plans have contributed significantly to effective early responses in serious spill incidents. It also sponsored, co-sponsored or assisted in the training of staff in the public and private sectors to respond to spill incidents.

During the year the Section received reports on 681 spills. Of these, 493 involved oil. The average oil spill involved 1,200 gallons.

Spill containment, clean-up and restoration is a relatively new program and expert instruction is in short supply. To assist those involved, staff have participated in the production of film and videotape training aids on various appropriate topics. These have helped to improve the state of preparedness to combat spills.

#### TECHNOLOGY DEVELOPMENT AND RESEARCH GROUP

The Technology Development and Research Group, comprised of three Sections -- Applied Sciences, Water Technology and Wastewater Treatment -- continued to provide innovative engineering design concepts and improved techniques in water and wastewater treatment and monitoring methods as technical backup and support services on behalf of the Ministry's program branches and regional offices, as well as for other ministries, municipalities and industry.

The Wastewater Treatment Section maintains the Ontario Experimental Facility at Brampton, a 5.0 MIGD activated sludge plant for use in developmental research work and operator training, and also operates an analytical laboratory. Eight technical papers were presented during the year on research projects.

Major investigations of the Water Technology Section were concerned with chlorinated organics, asbestos, ozone, water plant waste discharge and biota in water distribution systems. A survey of 105 water treatment plants in the Province was carried out to determine the characteristics of their waste discharges. A cost estimation of the appropriate methods to collect, treat and dispose of the wastes was made, with a report on this work being in the final draft stages at year's end. A survey concerning biota in water distribution systems, their abundance and possible methods of control was initiated. The monitoring program concerning chlorinated organics in drinking

water samples continued. Water samples from 32 municipal water supplies are being collected and analysed on a monthly basis.

The Applied Science Section continued to carry out project research work using the test facility and research laboratories at Resources Road in Rexdale, and at field installations of pilot plants and facilities. Section activities in 1975-76 resulted in the publication of 11 technical reports.

## environmental approvals branch

A major highlight of this Branch's operations in 1975 was the approval by the Legislature on July 14 of The Environmental Assessment Act. This legislation was three years in preparation and represents exhaustive consultation with the public. The Act was proclaimed in late 1976.

The Environmental Assessment Act injects new strategy into many Ministry programs by preventing potential environmental damage in the planning or conceptual stage of major projects. The Act requires that the proponents of major undertakings submit to the Minister of the Environment for comment and approval an Environmental Assessment which will forecast the effect the project will have on the environment, both natural and man-made, during construction and operation.

Under the new legislation the environment is defined as more than air, water and land, and man, plant and wildlife. It also encompasses social, economic and cultural factors, including buildings and structures.

Where the impact of projects may affect people, decisions must be made in consultation with the public. The new legislation, therefore, provides for such consultation in an open manner, with public comment invited and welcome. Once a review of the document has been prepared, it will be open for public inspection and comment for a period of at least 30 days. After this, the Minister of the Environment may decide that a Hearing should be held by the Environmental Assessment Board, an impartial decision-making body which will hear the pros and cons of the project and make a decision.

The Environmental Assessment Act will apply at first only to projects proposed by ministries and agencies of the Ontario Government. Ministries which will be particularly affected are

Environment, Natural Resources, Government Services and Transportation and Communications as well as Ontario Hydro. It is expected that the Act will be applied to the municipal and private sectors of Ontario in the near future.

While the Environmental Approvals Branch as a whole reviews many large projects, individual sections are involved in important studies and activities.

- The Industrial Approvals Section staff attend meetings of the Reactor Safety Advisory Board to review applications submitted by Ontario Hydro to the federal Atomic Energy Control Board for the Board's approval to construct nuclear generating stations. Through the Advisory Committee, the Section can issue provincially-oriented approvals for the plant without conflicting with the federal approvals requirements.
- The major function of the Industrial Approvals Section is to review the applications submitted by industry, and if appropriate, to issue Certificates of Approval allowing the industry to proceed with construction in accordance with pertinent provincial requirements. The number of applications received and processed during the 1975-76 fiscal year has been summarized in Table I.
- The Industrial Approvals Section has met during the year in an advisory capacity with representatives of restaurant operations to deal with odour problems. This is a serious local nuisance in some areas and the Ministry is working with equipment suppliers to solve the problem.
- The Municipal and Private Approvals Section jointly with the Water Resources Branch is developing methods of treating storm water runoff. This potentially serious pollutant enters rivers and streams from many sources, such as farming operations, city roads, parking lots and industrial sites. It is expected that the Ministry will issue guidelines on storm water management sometime in 1977.
- The Land Use Co-ordination and Special Studies Section participates, as members, observers or technical advisors, in committees and task forces that deal with overall provincial planning and land use matters. Some

of these committees or task forces deal with specific areas of the Province, such as: counties, regional municipalities, the Parkway Belt and river basins. Others are concerned with such matters as: economic development, agricultural land, research, environmental standards, policy formulation, and use of statistical data.

- One of the major projects the Design and Equipment Section was involved in last year was the quality control review of equipment to be used in the York-Durham water and sewage works which will, when completed, service major communities in the regional municipalities of Durham and York. This project, which was part of the approximately \$200 million worth of proposals reviewed and approved by the Section, involved the laying of many miles of pipe and the construction of a sewage treatment plant on the Lake Ontario shoreline just east of the Pickering nuclear generating station.
- The Environmental Assessment Section is in the process of co-ordinating the preparation of a detailed Ministry submission on environmental concerns to the Royal Commission on Electric Power Planning which is considering the planning of electric power supply in Ontario to the end of the century.
- The Section is also spearheading the Ministry's review of the large Lake St. Joseph iron ore mining development and attendant townsite in Northwestern Ontario. A special government task force is examining possible locations for a new town and a railway as well as potential pollution problems from the proposed mining operations.

## project co-ordination branch

The Project Co-ordination Branch, which has prime responsibility to manage, co-ordinate, and review all Ministry capital sewage and water projects from inception to the completion of construction, handled 262 contracts under construction during the fiscal year.

The Branch arranged the execution of final agreements on 24 new provincial projects, and 12 new municipal projects (see Table II). A number of water and sewage works were undertaken for municipalities having no communal facilities and extensions were made to existing facilities in many other municipalities. Major sewage and water projects were undertaken in South Peel Region, Niagara Region and York-Durham area and major extensions made to sewage treatment facilities in Kitchener and Georgetown to permit the development of new housing and correct environmental problems.

The Lambton Water System, serving the western area of the County, was made fully operational in 1975.

In the northern areas of the Province programs were developed to provide communal sewage and water facilities which would allow for growth and expansion of industry and housing.

The "Management by Results" (MBR) system, introduced into the Capital Construction Program during 1974-75, became fully effective this fiscal year. Due to provincial fiscal restraints, new projects were graded on criteria to determine priority of need before approval was granted. The MBR priority rating thus allowed projects to proceed subject to availability of funds and according to need, largely based on health and environmental considerations.

### MBR Project Evaluation in 1975-76:

	<u>No.</u>	<u>Value</u>
New Projects Evaluated	29	\$51,310,000
New Projects Accepted	19	33,370,000
New Projects Rejected (or Postponed)	10	17,940,000

The Capital Construction Program has provided services for almost 85 per cent of the municipalities in Ontario over the past several years, involving capital financing by the Ministry and/or utilization of the Branch's engineering expertise and advice.

The Branch continued to administer a new program of grants, introduced in the Budget in 1974, which amount to 15 per cent of the gross capital cost of regional or area sewage and water facilities being provided to regional or specially restructured municipalities.

Graphs I through IV for fiscal years 1971-72 to 1975-76, indicate growth in:

- (1) Number and value of contracts tendered;
- (2) Construction activity by numbers of contracts;
- (3) Annual total expenditures (for sewage projects and for water projects);
- (4) Annual total expenditures (for provincial projects and for municipal projects).

Late in the fiscal year, the Property Section was transferred to the Ministry of Government Services in order to unify the administration necessary for the acquisition of property and easements and related matters.

In anticipation of The Environmental Assessment Act, the Branch developed guidelines and procedures together with environmental controls in its contract specifications to meet the intent of the Act. Some major construction projects (e.g. South Peel and York-Durham schemes) were specific examples where environmental guidelines were incorporated into the construction documents and where public information meetings were held in advance of contract finalization.

## resource recovery branch

While waste management has traditionally been a municipal responsibility, and largely remains such, the Resource Recovery Branch was established in 1974-75 to co-ordinate the Province's resource recovery program, necessitated by the growing scarcity of landfill sites to dispose of urban garbage, and the need for conservation of energy and natural resources.

During 1976, the Branch was transferred from the former Utility and Laboratory Services Division to the Environmental Assessment and Planning Division.

Key program elements of the Resource Recovery Branch have focused on construction and technology development of the Experimental Plant for Resource Recovery in North York; development of municipal processing plants; demonstration projects for waste reclamation; and waste management planning.

### Resource Recovery

The Ministry commenced design of a full-size Experimental Plant for Resource Recovery in 1973-74, and construction began in the winter of 1975. The Experimental Plant is being built in North York at an estimated cost of \$13.5 million, capable of processing 800 tons of solid waste daily. The plant will become operational in the summer of 1977.

The principal objectives of the plant are:

- to develop and evaluate processes and equipment for resource recovery;
- to develop criteria for estimating capital and operating costs of a range of plant sizes and process combinations;
- and, to provide a regular supply of recovered resources of controlled quality for product utilization and market development.

### Municipal Processing Plants

Under the provincial Waste Management Program the Ministry offered to finance and construct waste processing plants in the Regional Municipality of Sudbury, City of London, Regional Municipalities of Halton and Peel, Metropolitan Toronto and Eastern Ontario. Fifty per cent of the capital cost of the plant would be recovered as a user charge over a 40-year period.

Feasibility studies were initiated in each of these municipalities to provide more detailed information on plant costs, waste management system costs and potential markets for recovered materials. This information would then form the basis for an agreement with the municipality and the Province.

### Demonstration Projects

The Ministry is further encouraging the development of Resource Recovery by providing partial funding in demonstration projects. One of these with great future potential and promise is the "Watts from Waste Project".

Under an agreement with Metropolitan Toronto, Ontario Hydro and the Ministry, this project will examine the feasibility of using refuse-derived fuel (RDF) as a partial replacement for coal in a boiler at Lakeview Generating Station. The project



will proceed in two phases with Phase 1 expected to commence in 1979. In this phase a processing facility constructed by Metropolitan Toronto would recover 130,000 tons of RDF from 210,000 tons of solid waste. This quantity of RDF would replace approximately 57,000 tons of coal. Preliminary design leading to environmental approval of the plant and site is under way.

#### Waste Management Planning

Assistance is available to municipalities to carry out waste management system studies leading to resource recovery. Studies during 1975-76 were active in the following municipalities: Regional Municipalities of Peel, York-Durham and Niagara and Counties of Northumberland and Middlesex-Elgin.

## regional operations and laboratories division

Assistant Deputy Minister: J.R. Barr

The Ministry's six regional offices (see map) completed their staffing and became fully operational in 1975-76.

The regional offices, supplemented by 23 district offices, provide environmental protection services such as abatement programs and complaint investigation, regional environmental assessment activities and the operation of sewage and water projects throughout the Province. In each of the six regions these programs are carried out by four sections: Industrial Abatement, Municipal and Private Abatement, Technical Support (environmental monitoring and planning) and Utilities Operation.

In February 1976, the Laboratories Services Branch was transferred to the Regional Operations Division. The Branch is responsible for the main laboratory located on Resources Road in Rexdale and the co-ordination of regional laboratories in Kingston, London and Thunder Bay.

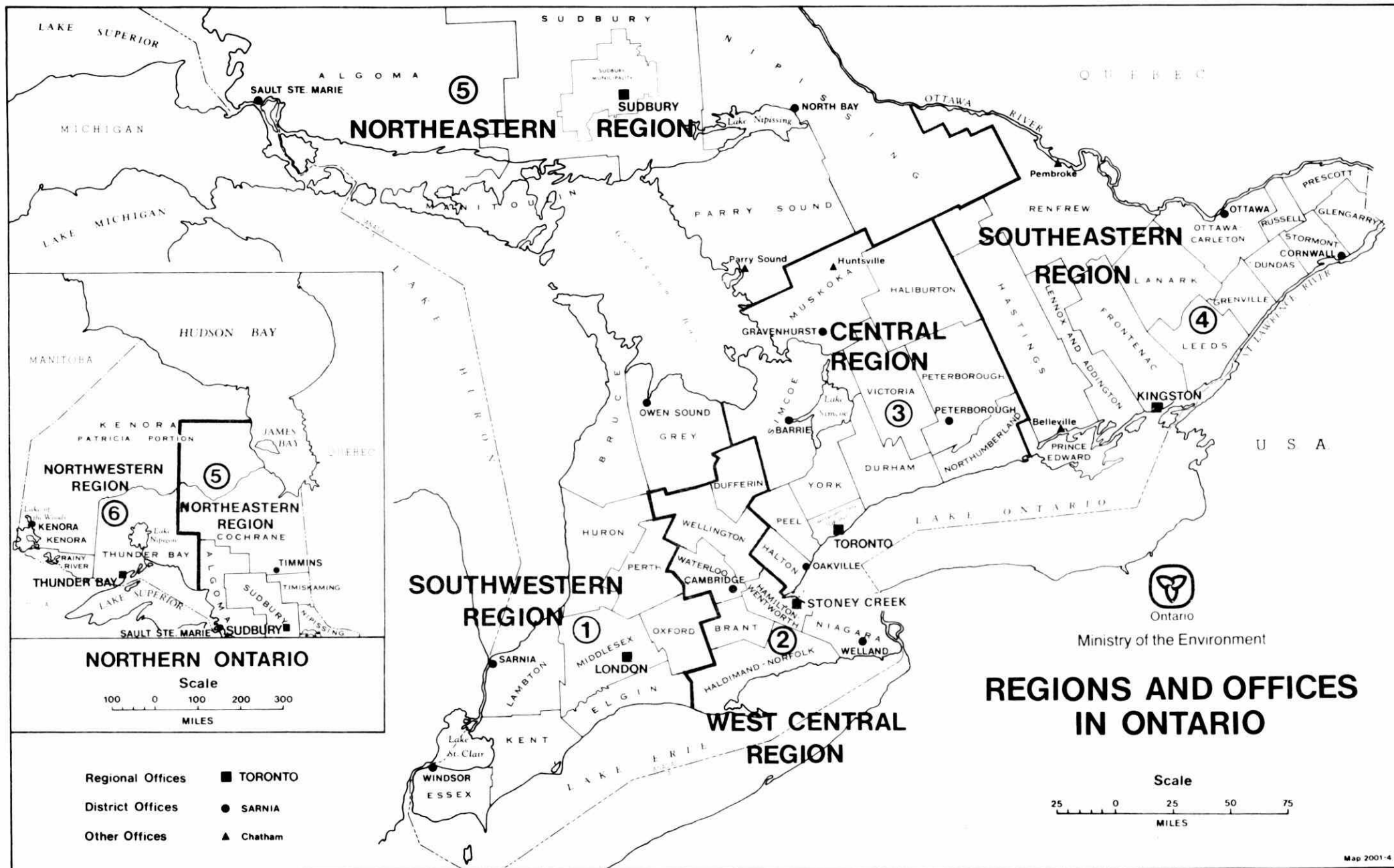
#### Municipal and Private Abatement Section

The growing strength of the Ministry's regional operations is reflected in the greatly increased number of inspections and pollution control measures carried out in the field during the fiscal year.

During the year 1,940 inspections were made of the 1,440 water works systems in the Province, compared with 1,172 inspections made last year. Another 1,419 inspections were made at 779 sewage works in Ontario, compared with 1,101 inspections carried out in 1974-75.

The number of septic tanks inspected decreased from 10,359 in the previous year to 7,794, reflecting the takeover of part of the program by Health Units. Checks on pleasure craft and marinas increased from 2,438 in 1974-75 to 3,114 this year.

To determine the effectiveness of pollution control measures and to locate pollution sources, 363 municipal pollution surveys were undertaken. In recreation areas, 8,898



cottage properties were inspected, compared with 6,085 last year, to detect malfunctioning systems.

The waste management program entailed 5,003 inspections of 2,355 sites and systems. This can be compared with 2,865 inspections made in the first year of regional operations. This program includes approval, inspection and promotion of sanitary landfill sites, incinerators, processed organic waste disposal sites and systems, and derelict motor vehicle sites. The major thrust of the program is to bring about the development of new and improved waste facilities and then close down inadequate sites.

Complaints received from the public are valuable in detecting violations. During the year, 4,440 complaints were received and investigated.

In the planning field, staff reviewed plans respecting water and sewage facilities on 1,389 proposed subdivisions, 6,926 lot severances, and official plans and amendments, to ensure against potential pollution or water problems.

#### Industrial Abatement Section

Industrial Abatement staff in the six regions spent considerable time during the year investigating, surveying and abating some 241 major industrial sources. This was nearly double the number dealt with in 1974-75, indicating that the year-old regional and district offices had consolidated their newly established operations. The sections also dealt with 39 significant new sources of industrial pollution.

Abatement programs are normally negotiated and set to permit time for corrective action and for delivery of pollution control equipment. Where court action is necessary, the gathering of evidence can require weeks of painstaking work by specially trained field personnel and the use of sophisticated monitoring devices and physical and chemical analysis. New technology has enabled detection devices and methods of analysis to become increasingly more efficient. Table III indicates that the Ministry dealt with 24 court cases relating to industrial sources during 1975-76 and issued 27 control or amending control orders. Ministry smoke emission cut-back orders under the Air Pollution Index totaled 17.

In connection with Ministry control and abatement orders

and programs, industrial sources in the Province spent or committed \$177.5 million in capital funds for pollution control. This sum was up 25 per cent over the previous year's expenditures, indicating increased environmental consciousness.

In addition to other activities, Industrial Abatement sections provided a 24-hour first-line engineering assessment and co-ordinating function under the Ontario Contingency Plan for 912 accidental spills of oil and other hazardous substances. This 27 per cent increase in the number of spills over the previous year is a reason for Ontario calling for more stringent safeguards in handling hazardous substances and demanding stricter marine controls on the Great Lakes through the International Joint Commission.

As Table III illustrates, the number of complaints received and investigated in 1975-76 totaled 6,746, most of which concerned odour, smoke or emission of particulate matter or dust. Farm visits under the Certificate of Compliance Program was up sharply over the previous year, totaling 684.

#### Utility Operations Sections

These sections continued to supervise, operate and regulate water and sewage works financed and constructed by the Ministry under agreement with the municipalities served.

As at March 31, 1976, there were 249 such facilities (83 water and 166 sewage) operating in 246 municipalities requiring a total of 524 plant operators on staff. This compares with 219 facilities (75 water and 144 sewage) operating in 218 municipalities requiring a total of 445 plant operators in the 1974-75 fiscal year.

Approximately \$160 million were invested in water and sewage capital works in 1975-76 resulting in a total capital cost for all Ministry-operated projects of \$760 million.

Graph V shows the distribution of operating costs for the year ending March 31, 1976 and Graph VI shows the growth in the number of projects operated by the Ministry for municipalities.

#### Technical Support Sections

During the year, Technical Support Sections in the regions completed their staffing in the four subsections: Air Quality

Assessment, Water Resources Assessment, Approvals and Planning and Laboratory Services.

Staff dealt with a wider variety of investigations, evaluations and reports which varied considerably from region to region depending on the prevalence of specific problems. The sections published 41 formal reports on a variety of subjects, including major recreational lake and river basin surveys, ground water surveys and air quality surveys.

#### Air Quality Assessment

Air Quality staff maintain over 1,100 air monitoring installations across the Province, measuring particulate matter, sulphur dioxide, fluorides and other air contaminants.

In the two northern regions, all vegetation and soils evaluations are carried out by regional staff, with 69 complaints investigated during the year. In the southern regions, phytotoxicology problems are handled by the Air Resources Branch.

#### Water Resources Assessment

During the year the staff carried out a number of waste assimilation studies, comments on 272 water and sewage works, 65 landfill applications and 307 applications for water impoundment, marine construction and pit and quarry proposals. In addition, staff investigated 545 complaints, most of which concerned well interference and well pollution problems. The six regions operated and maintained a network of water quality stations totaling 155 streamflow stations, 559 water quality stations and 283 observation wells.

#### Approvals and Planning

Staff dealt with 539 non-complex air approval applications and reviewed 255 more complex applications which were forwarded to Head Office for approval. Water taking permits issued totaled 525. The Planning staff commented on 364 official plans and amendments and 755 subdivisions. In two of the regions, the subdivision comments were co-ordinated by the Municipal and Private Section staff and are not included in these figures.

#### Laboratory Services

Regional laboratories at Kingston, London and Thunder Bay processed a greatly increased number of samples (see Table below). The increase in productivity was most marked in the Kingston Laboratory as this Unit moved from a van to a properly equipped laboratory accommodation.

<u>Region</u>	<u>Microbiology</u>		<u>Change</u>
	<u>1974/75</u>	<u>1975/76</u>	
S.W. Samples	11,608	14,036	+21%
Rec'd.			
Tests	39,382	51,036	+30%
Completed.			
N.W. Samples	7,620	9,051	+19%
Rec'd.			
Tests	22,899	28,663	+26%
Completed.			
S.E. Samples	5,020	7,539	+50%
Rec'd.			
Tests	15,787	24,944	+58%
Completed.			
<u>Region</u>	<u>Chemistry</u>		<u>Change</u>
	<u>1974/75</u>	<u>1975/76</u>	
S.W. Samples	13,961	17,101	+22%
Rec'd.			
Tests	118,048	157,946	+34%
Completed.			
N.W. Samples	7,042	8,840	+26%
Rec'd.			
Tests	51,806	62,415	+20%
Completed.			
S.E. Samples	4,057	6,965	+74%
Rec'd.			
Tests	16,893	48,327	+187%
Completed.			

## laboratory services branch

This Branch continued to provide analytical support to the Ministry's environmental quality assessment and pollution abatement programs, and to undertake research projects aimed at clarifying the interaction of aquatic and atmospheric contaminants with the environment, and their possible effect on the quality of human life.

A total of 1,682.9 thousand tests were performed by the central and regional laboratories during the year, about 20 per cent more than the previous year. Regional laboratories, in Kingston, London and Thunder Bay, increasing their output by 41 per cent, took over a larger share of the work load (22.2 per cent in 1975-76 cf. 18.7 per cent in the previous year). The growing interest in trace metals and organic contaminants is reflected by the large increase in tests performed by the two trace contaminants sections (Table IV).

The Ministry's regular programs were the major users of laboratory services accounting for 73 per cent of the tests performed, while the International Joint Commission programs accounted for 16 per cent of services. The remaining tests went for the support of special projects (see Table V and Graph VII).

While testing air, water and waste water quality remained the major task of the laboratory, special attention was given to a number of problem areas, such as various aspects of mercury pollution, toxic trace metals such as lead, arsenic and selenium, pesticides and PCBs, polycyclic aromatic hydrocarbons, organics in drinking water, vinyl chloride, freons in air, etc. Recognizing the important role the sediment plays in the environmental processes, considerable effort was invested in developing a capability for meaningful sediment analysis. Similarly, a detailed assessment of physical and chemical methods which would make a comprehensive air quality evaluation possible, became one of the important objectives of the Branch's method development program. In this regard, asbestos required special attention, as the potential health hazard associated with this substance found in both air and water caused serious concern and prompted efforts to develop an asbestos analysis method based on electron microscopy.

The discovery of the correlation between dissolved oxygen

concentration and the depth of lakes led to further studies of this phenomena, as it is known that oxygen concentration distribution patterns seriously affect aquatic life. The identification of a number of halogenated compounds in drinking water directed the attention to the use of chlorine as a water and waste water disinfectant and studies to clarify the chemical processes involved were initiated. The continuing interests in the restoration of acid lakes led to investigations of the effects of pH changes on the distribution and availability of trace metals and nutrients as prerequisites of aquatic life. Laboratory staff provided the analytical services required in the above-mentioned investigations.

The wide range of problems requiring attention compared to the limited resources of the laboratory indicated the need for realistic priority setting and systematic organization of R & D activities. A system has been implemented requiring a preliminary plan for any major undertaking with well defined objectives, work programs, manpower requirements and cost estimated. During 1975-76 the laboratory staff initiated 76 scientific projects, while contributing to several others initiated outside the Laboratory Services Branch.

More than 50 new and/or modified analytical procedures were introduced and several others improved during the year. All new methods went through a systematic validation process before implementation.

Spectrography made its initial entry into the field of multielemental and diagnostic analysis. The solution technique using rotrode excitation proved to be a valuable screening technique and a semiquantitative multielemental analysis method. A long-term program to explore the special capabilities of this computerized instrument is under way. Its limitations in diagnostic elemental analysis is compensated by the special capabilities of the non-destructive X-ray fluorescence technique, which was primarily used for the determination of sulphur in vegetation samples during the year.

The Gas Chromatography-Mass Spectrometry-Computer System provided the laboratory with the capability of identifying organic compounds. The technique first used by the laboratory to verify the identity of methyl mercury determined by electron capture gas chromatography has gradually been applied to the identification of pesticides, PCBs and haloforms in drinking water and a series of other suspected and unsuspected pollu-



tants. The analysis of environmental samples for organic constituents acquired a new dimension by the application of this technique.

High pressure liquid chromatography gained renewed recognition as the best technique to separate non-volatile compounds. Coupled with a spectrofluorophotometer, it was used for the determination of soluble carbonyl compounds, dicarboxylic acids and polycyclic aromatic hydrocarbons.

The laboratory's two electron microscopes permit the individual examination of very small particles. The transmission electron microscope was used exclusively for asbestos analysis, while the use of the scanning electron microscope for combined morphological and chemical analysis of individual particles has not yet been fully explored, but initial tests indicate a great potential in producing information on the composition of air particulate and water-suspended materials.

Many of the results of the R & D work carried out by the laboratory are of special interest for the users and in general for the scientific community. Such results were summarized in Ministry reports, many of them published or presented at various conferences. A total of 23 papers and 65 reports were prepared by the staff during the year.

The Laboratory Services Branch is gaining international recognition and scientists from the United States, Sweden, New Zealand, Libya, Hungary, United Kingdom, West Germany, Mexico, etc., visited the laboratory and initiated information exchange.

## northwestern region

Regional Director: L.F. Pitura

Programs in Northwestern Ontario are chiefly administered through offices in Thunder Bay and Kenora. The region is vast, much of it covered with forest and sparsely populated except for a number of major centres. The livelihood of the majority of the inhabitants springs from the primary resource and tourist industry. Due to the climate, geology and population distribution, and the fact that much of the area is municipally unorganized, many of the environmental problems faced are

unique and require considerable ingenuity to arrive at acceptable and economic solutions.

Two major concerns during the year were the presence of asbestos in the Thunder Bay water supply and the longer-term question of the impact of mercury previously discharged to the Wabigoon-English River system. As the City of Thunder Bay undertook to construct a modern water filtration plant, there should be no continued public concern of a health hazard due to the presence of asbestos. While it was not possible to resolve the problem of mercury contamination in the river system, much data was collected that helps evaluate the extent of the problem, rate of recovery through natural processes and, hopefully, in the future will assist in the evaluation of proposed remedial measures.

As a result of Industrial Abatement Section activities during the year and the preceding fiscal year, \$47 million in pollution abatement facilities were approved for the region's industries over the 1975-76 period. This sum included \$28 million in the forest industry, \$9 million in the mining industry and \$9 million in the Thunder Bay terminal grain elevators.

Highlights of these programs were approval of the closed cycle effluent system for the new kraft mill being constructed by Great Lakes Paper Company in Thunder Bay; approval of pollution control facilities for the new Pluswood Ltd. particle board plant in Atikokan and the new Umex base metal mine in Pickle Lake. Also, air pollution controls were approved for the iron ore reduction plant being built by the Steel Company of Canada at Griffith Lake, Ear Falls, and facilities to control arsenic oxide emissions from the roasting operation at the Dickenson Mines gold mine, Balmertown. Completion of pollution abatement facilities for emissions from the terminal grain elevators over the next few years will eliminate a major air pollution problem in Thunder Bay which has been of concern for many years.

All municipal water systems and all sewage works in the region were inspected during the year. Major progress was made in Thunder Bay with commencement of construction of a 24 million gallon per day sewage works and several major sanitary sewer interceptors to serve developing areas and eliminate direct discharge of sewage to area waters as had occurred in the past.

Staff also continued with a cottage pollution control program on recreational lakes. During the year, over 1,200 cottages and commercial establishments were investigated. Cottagers have been quick to respond to staff recommendations with the result that pollution from such sources is considered controlled and no threat to water quality in the areas surveyed.

Collection of derelict motor vehicles was initiated at Dryden and Kenora, where 741 vehicles were collected and hauled away for recycling. This project, "Project Remove", has been very successful in accomplishing its goals.

During the year, new sewage treatment plants at Schreiber and Geraldton were placed in operation, and also water supplies at Ignace and Vermillion Bay.

Major water quality studies were undertaken on Lake of the Woods, Manitouwadge chain of lakes, Thunder Bay Harbour and the Wabigoon, English and Winnipeg River system. Follow-up on previous lake studies was completed and a number of surveys carried out on recreational lakes.

Sample load to the Thunder Bay laboratory again increased by approximately 25 per cent over the previous year. Approval was granted for construction of a much needed new Regional laboratory and construction began in March 1976, with completion scheduled for April 1977.

## northeastern region

Regional Director: R.E. Moore

The activities in this Region increased considerably following the Ministry reorganization a year earlier.

The number of air monitoring instruments in the Region were increased by 35 per cent to total over 200. A new Air Pollution Index Station was established in New Sudbury in January 1976. An efficiency of over 90 per cent valid data was maintained at most stations.

Several major watershed studies were undertaken in the Region, including Lake Temiskaming, Junction Creek, Serpent

River and Round Lake. Mercury studies in fish and lake sediments were also initiated.

All facets of the Sudbury Environmental Study were fully integrated under a full-time co-ordinator in September 1975.

Industrial abatement activities included the installation of waste water treatment facilities on Copper Cliff and Nolin Creeks, a water clarification system at International Nickel Company's Garson Mine and a recycle of tailings pond decant at Falconbridge's Levack Mill. A commitment was received from Eddy Forest Products for a \$9 million hot stack refining-oxygen bleaching project at its Espanola mill; an environmental improvement project was initiated on a smelter at Falconbridge Nickel Mines; and a Control Order relating to air emissions was issued to Algoma Steel with reference to its Sault Ste. Marie mill. The Ministry funded a joint study with the Ministry of Energy to utilize wood wastes to generate energy from saw mills in the Hearst area.

A survey of all active and inactive uranium mining properties was carried out in the Elliot Lake area to provide the basis for Control Orders.

There was also a significant increase in the activities of the Municipal and Private Abatement Section which undertook surveys of 3,000 cottage properties, a 15-fold increase over the previous year. Complaints handled were up 50 per cent, and attributed to an increasing awareness of Ministry presence in the Region. Meetings attended by staff almost doubled in number. Boating and marina inspections tripled over that of the previous year.

The derelict motor vehicle program, "REMOVE", was enthusiastically adopted by a large number of communities in the northern part of the Region.

The Utilities Section operated or administered a total of 52 treatment facilities, including 18 waterworks and 34 sewage treatment plants.

Five new water treatment plants were brought into operation to serve the communities of Bruce Mines, Latchford, Verner, Callander and Manitowaning. Six new sewage treatment facilities were built to serve Bruce Mines, Latchford, Verner, Webbwood, Callander and Manitowaning.

An expansion to the North Bay Water Pollution Control Plant doubled its capacity from four to eight million gallons per day.

## southwestern region

Regional Director: D.A. McTavish

Continued progress was achieved in many of the abatement programs of the Southwestern Region. Recently commissioned industrial waste treatment facilities at Imperial Oil Enterprises and the development of a program for controlling waste discharges from Polysar Limited in Sarnia have contributed to a decrease in the discharge of contaminants to the St. Clair River.

In view of mercury contamination of sediments in the St. Clair River, the Ministry has prohibited disposal by transfer to other parts of the river bottom of dredgings removed from areas where the mercury content of the sediments is considered to be excessive. The St. Clair River Parkway Commission has co-operated with the Ministry in allowing the placement of mercury contaminated sediments behind sheet piling located along the shoreline.

In the Windsor area a decrease in the contaminants discharged to the atmosphere was achieved at several industries located in the area. Major changes at the Ford Motor Company works resulted in a reduction of approximately 50 per cent in the suspended particulate matter discharged as compared to previous years. A similar reduction in the emissions of fluoride from the Allied Chemical plant in Amherstburg was also experienced during 1975.

The J.C. Keith Generating Station, owned by Ontario Hydro has in the past been responsible for elevated levels of SO<sub>2</sub> and particulates in the vicinity of the plant. During 1975, Ontario Hydro announced a decision to close the station for at least 30 months. Ontario Hydro has been informed that stringent requirements for air quality protection must be met prior to the start-up of the plant should it be necessary to resume production of power at the station.

The memorandum of understanding on transboundary air pollution control signed by the Premier of Ontario and the

Governor of Michigan has continued to benefit the air pollution control programs of both Ontario and Michigan, and has especially served to improve air quality for Windsor residents. The memorandum establishes a mechanism to integrate the air quality monitoring data generated on both sides of the international boundary and provides an opportunity for each agency to be regularly brought up to date on the status of air pollution sources and abatement action.

One of the first areas in Canada involved in the production of oil was Petrolia. Many of the small wells have been returned to operation following the increased cost of oil. The disposal of oil field brines from these wells has been a continuing problem which has intensified with the increased operation. Several of the operators have established shallow detention ponds through which the brine flows prior to discharge to the receiving stream. These ponds have been found to reduce some of the hydrogen sulphide odour associated with the brine but have not been successful in removing other contaminants impairing the quality of receiving streams. Studies are continuing to develop alternatives to the discharge of oil well brine to surface waters.

Prior to 1976 odour complaints were received concerning the Ontario Hydro Bruce Nuclear Power Development operation. Two new water holding lagoons were constructed to serve the existing and new heavy water plants, and to provide temporary storage of water containing elevated levels of hydrogen sulphide due to process upsets. Revised operating procedures and process changes have resulted in improved control of hydrogen sulphide gas emissions.

The farm certification program is a voluntary means of assessing the environmental impact of new, remodeled or enlarged livestock facilities. The program is gaining wide acceptance in this Region as indicated by a total of 337 farm applications in the past year, which represents an increase of 68 per cent. Certificates of Compliance were issued for 87 per cent of the applications evaluated. The certification program has helped to avoid numerous situations which could have led to neighborhood odour problems, pollution of streams and costly abatement programs.

The number of unsatisfactory sanitary landfill operations continue to decline with the emergence of larger, more efficient sites. Studies for two resource recovery plants, for London and



for Windsor, were initiated during the year and in addition three area studies on solid waste handling and disposal were started. Unsuitable landfill sites were closed in Egremont, Stephen and Stanley townships, and steps taken to close the Owen Sound site. All landfill sites were inspected on an average of three times each during the year, and site operators have responded well to suggestions for improved operating practices.

The Region is a popular area for boating and as part of the boating program all marinas in the Detroit River, Lake St. Clair, Lake Huron, St. Clair River and Lake Erie areas were visited during the summer. All but one of the marinas were in compliance with regulations requiring pump-out facilities. Approximately 96 per cent of the 130 boats inspected were in compliance.

Regional staff assisted the cities of Windsor, Chatham, London, and Woodstock in their plans for the expansion of sewage treatment facilities. Major works will be constructed in each of these communities over the next few years. The impetus for expansion in many Southwestern Ontario communities resulted from the recommendations of the Thames River Basin Study published during the year and as a result staff have been involved with many communities in developing long-term plans which will enable objectives of the report to be met. Each sewage treatment facility in the Region was inspected approximately three times during the year.

Inspection of water treatment facilities in the Region indicated a high quality of water was being supplied.

Ninety-one cases of water supply interference were reported during the year. Since English common law offers no protection to subsurface interference, The Ontario Water Resources Act and related policies of this Ministry play a vital role in safeguarding ground water supplies, particularly important in the Southwestern Region where there is a pronounced dependency on ground water sources. Forty-eight cases of contamination of water wells were brought to the attention of the ground water staff and most of these were satisfactorily resolved.

Several major surface water studies were carried out to substantiate the need for improved waste treatment facilities and water quality controls. A prime example was the preparation of a report defining surface water quality and waste loading guidelines for the Kettle Creek Watershed. This report suggests

short-term alternatives for improvement of municipal and industrial discharges based on up-graded treatment and low-flow augmentation and introduced the long-range alternative of developing a common sewage pipeline to Lake Erie to serve both St. Thomas and London.

Improvements to the London Regional Laboratory resulted in improved data and reduced labour costs. The laboratory staff provided analytical support to the "Pollution From Land Use Activities Reference Group" (PLUARG). Samples originating from sites in the Region were analysed by the London lab. Also performed were the analyses required for the Great Lakes Water Quality survey program covering Western Lake Erie, Lake Huron and the connecting waterways.

In this Region the Ministry supplies water and waste water disposal services on a wholesale basis to 96 municipalities, serving a population of 690,000.

Major projects which began operation in the year were the Lambton Area Water System, which serves the western half of Lambton County including the City of Sarnia and the Harrow Water Treatment Plant which serves the Town of Harrow and the Township of Colchester South. New projects of a smaller size included sewage facilities for the Villages of Glencoe, Dutton, Comber and Paisley and the Town of Harrow. Trunk watermains were laid to supply the Town of Kingsville, and the Mitchell's Bay Water Treatment Plant was completed.

## west central region

Regional Director: C.J. Macfarlane

West-Central Region staff were heavily engaged with water resources in this populous industrial area. The recovery of water quality in Hamilton Harbour was given a much needed fillip with the summertime destratification of the water using a simple and cheap aeration process. A study of Cootes Paradise, the scenic wildlife sanctuary adjoining the Harbour, was conducted to provide a basis for the design of the new Dundas Sewage Treatment Plant.

The Region was deeply involved in a practical investigation into future water supplies for the Kitchener-Waterloo area drawn from the Grand River and stored in suitable riverside soils. Less spectacular, but equally demanding work was performed in the development of water supplies and sewage treatment to serve the rapidly burgeoning industrial and municipal growth in Haldimand-Norfolk.

Substantial decreases in air contamination were measured in Hamilton and Welland. Improvements in Hamilton stemmed largely from added controls in iron and steel-making works; improvements in Welland were associated with the closing of the Union Carbide ferro-alloy furnaces. However, despite the introduction of expensive odour controls in many industrial plants, success seems often elusive since unless there is a sudden and total removal of an objectionable odour, the improvements tend to go unnoticed.

The most difficult job faced in industrial abatement is achieving substantial reduction of pollution from coke ovens without impairing the health of coke oven workers. This task is being carefully devised under the close guidance of the Ministry of Health.

The abatement of water pollution arising from the steel industry showed marked progress during the year.

## central region

Regional Director: P.G. Cockburn

Extending from Halton on the west to Northumberland County on the east, and north to Huntsville and Georgian Bay, Central Region serves one of the heaviest industrialized and intensively used recreational areas in the Province.

Significant activities were the air quality improvement program in the core area along Lake Ontario, environmental control activities in recreational areas, and the waste management site development program.

In the highly developed area centering on Metro Toronto, major improvement was achieved in air pollution. The API only exceeded the maximum desirable level of 32 on two occasions.

Table VI presents the number of occasions the API exceeded the desirable level for Toronto since its inception in March 1970. Graphs VIII and IX show the reduction of SO<sub>2</sub> and suspended particulate matter in downtown Toronto during the past decade.

During the year 380 applications were processed related to air emissions, and evaluations involved analysis of equipment for controlling emissions of such contaminants as asbestos, lead and other heavy metals. In efforts to improve air quality, 75 violation notices and 25 orders were issued and 14 court actions initiated. Air abatement programs estimated to cost \$2.8 million were initiated at five petroleum refineries. Other air abatement programs cost 18 other industries \$7.5 million, including metal refineries, packers and asbestos-handling industries.

Odour control at Metro Toronto's sewage treatment plants was achieved by covering open tanks at three plants and the start of air treatment procedures at another. Start-up of Toronto's new Commissioner Street incinerator took place and planning commenced to replace other inadequate incinerators.

Recent introduction of improved auto emission controls and increased use of non-leaded gasoline have reduced carbon monoxide and ambient lead levels in the large urban areas. High ozone levels were monitored in rural areas outside Metro Toronto because of potential damage to agricultural crops, resulting from phytochemical reactions between hydrocarbons and oxides of nitrogen.

Intensive monitoring for airborne lead in the vicinity of five Toronto-area lead plants continued through 1975-76 while the plants installed pollution abatement equipment. Five plants using asbestos in the Region were also monitored and required to comply with abatement measures.

Major expansion of the air monitoring network during 1975 was installation of a complete monitoring station in Oakville, similar to seven other stations now operated in Central Region.

In recreational areas, control activities continued to be carried out through shore/cottage pollution surveys; self-help lake quality monitoring; lake quality surveys; official plan, subdivision and lot severance approvals; and approvals of septic tank systems. Recreational areas monitored include the Wasaga-Honey Harbour area, part of Georgian Bay, the Muskoka Lakes, the

District of Haliburton, the Kawartha-Trent corridor, Lake Simcoe and Lake Ontario.

During the summer of 1975, student summer staff inspected a total of 2,875 private sewage disposal systems on eight lakes. All cottagers with systems classified as nuisances or direct polluters were required to take corrective action. Cottagers were generally receptive, and good co-operation was obtained.

During 1975-76, 10,400 certificates of approval were issued for private sewage works and septic tanks, approximately half of which are located in sensitive recreational areas. Major water quality surveys were taken on a number of lakes, while 56 cottage associations participated in self-help water quality monitoring programs designed to maintain a continuing record of the trophic status of their respective lakes.

Four regional municipalities surrounding Metro Toronto were at various stages of completing waste management studies. In the spring of 1976, the Ministry financed a study intended to co-ordinate various area studies together with Metro Toronto's needs in an effort to establish policy guidelines for waste management programs in the central core area of the Region. Since landfill sites for garbage have become extremely scarce, the thrust of future waste management programs must of necessity relate to resource recovery and energy conservation.

In Metro Toronto, at the year end, a full-scale resource recovery plant with a 200-ton per day capacity was under construction. A 600-ton per day plant was under design for the product of a waste-derived fuel for the Lakeview Generating Station. The project, known as "Watts from Waste", is expected to be operational by 1979. Additional studies are under way for the installation of a central steam generating plant in Toronto using garbage as a fuel source.

## southeastern region

Regional Director: C.E. McIntyre

The year marked the move to a consolidated regional office and laboratory in Kingston from the previous three office locations and a separately located mobile laboratory, resulting in better co-ordination and more efficient operations.

The Southeastern Region is known for its abundance of recreational lakes, as well as the Ottawa, Rideau and St. Lawrence River valleys. In order to establish the status of the lakes, a five-year program was initiated in conjunction with the Ministry of Natural Resources, and 49 lakes surveyed during the year. Through definition of the existing status, future use of each lake as a fishery and recreational resource can be established and controls implemented, if necessary, to ensure water quality is preserved.

The phosphorus removal program was almost totally initiated before the end of 1975. The few outstanding facilities are those where major construction, including phosphorus removal, is to commence shortly and where temporary phosphorus removal facilities were considered not practical.

Significant advances were made in the control of wastes from pulp and paper plants in the Region. For the first time, Domtar Fine Papers in Cornwall met the federal regulations for BOD<sub>5</sub> and suspended solids. The Canadian International Paper mill in Hawkesbury was on schedule with compliance on a Ministry Order. The liquid waste products from Strathcona Paper Company were covered with a Notice of Intent. Compliance with these orders will virtually eliminate the pulp and paper mills in the Region as a problem to either air or water pollution.

Field work and sampling were undertaken to collect data for the control orders to be subsequently issued to Courtaulds (Canada) and TCF of Canada, both in Cornwall. The control of these liquid emissions will virtually eliminate the problem of direct discharging industries from Cornwall.

As a result of public awareness of Ministry offices in the Region and their effectiveness in resolving problems, the number of complaints of all kinds almost doubled to 1,434 in the fiscal year. More than 85 per cent were satisfactorily resolved.

Resolution of contamination of ground water, soil and surface water by arsenic and vanadium from Masterloy Products in Ottawa was complicated by discovery that some of the waste products were also radioactive. A draft control order, prepared in co-operation with the AECS, was nearing completion to be served in the new fiscal year.

In an effort to retain the Rideau River as an excellent recreational resource in the heart of the Ottawa urban area, the first program in Ontario of storm water management was initiated. Like any new program, an information activity to convince the public and their representatives of its necessity is required and is proceeding.

The problem with municipalities not accepting their responsibilities to enforce their sewer use bylaws continued. This is most acute in high unemployment areas and smaller centres where there is a fear that enforcement might lead to the industry closing, thus putting local citizens out of work and reducing the industrial tax base.

## finance and administration division

Executive Director: G.E. Higham

This Division provides a complete range of support services to the operating divisions required for the efficient operation of the Ministry. As the Ministry's central agency it has extensive responsibilities in three general areas: service, control and co-ordination.

Division responsibilities to the Ministry, to staff and to the public involve a number of central services and administrative functions, such as public information; legal advice and action; staff recruitment and payroll preparation; office services, including allocation of accommodation and printing; purchasing; systems development; and financial administration, to ensure that expenditures comply with levels set in the annual estimates approved by the Legislature.

Improved financial controls and strict attention to purchasing practices during the year reflected increased government concern about inflation and increased costs.

New planning and control systems, including computer-based recording and reporting systems, were established for capital and management programs, resulting in more effective planning and operating efficiency.

During 1975-76 the Division concentrated on providing the most efficient support possible for the Ministry's programs and activities consistent with new demands stemming from the Ministry's recent decentralization of services.

## administrative services branch

The demand for administrative support services was at a level equal to that of the previous fiscal year, when the Branch underwent reorganization to cope with the increased demands from decentralization of Ministry services. Subsequent reduction in staff complement imposed a heavy work load in order to maintain an acceptable level of service. The service group most affected was the mechanical group, or the production shops, of the Operating Services Section, which are being



phased out. The exception was the Laboratory Stores Unit, which was proposed to be transferred to the Laboratory Branch of Regional Operations Division in November 1976.

During the year, the Purchasing Section's activities showed a slight increase in the number of order units processed. Processing the work has increased substantially as a result of inflation and difficulty in negotiating firm costs with suppliers.

The transfer of the Cartography and Drafting Section to this Branch provides a new service available to all divisions of the Ministry.

### Systems Development

Systems development work continued in a number of areas throughout the Ministry. Branches in conjunction with System Development resources defined their information requirements, conducted feasibility studies, designed, programed and implemented new systems. Some examples:

- The Water Resources Branch developed and implemented the Sample Information System and the Water-taking Information System and continued work on a number of water modelling projects in order to assist the Branch in managing the water resources of the Province.
- The Pollution Control Branch continued work on the utility-related information processes to assist the Branch in defining long-range capital requirements and also to control pollution loadings to receiving waters. The Branch also implemented the Revenue Control Module of the Pesticides Information System.
- The Project Co-ordination Branch developed and implemented the Utility Project Management System to help in scheduling, forecasting and controlling the building of water and sewage treatment plants.

## financial services branch

The Branch provides financial services for the operating programs of the Ministry, administers the processing of transfer payments under The Pollution Abatement Incentive Act and is responsible for the financial management of the Province's investment in water and sewage projects.

Due to an increasing work load and constraints on staff complement during 1975-76, the Branch directed considerable thrust to conducting feasibility studies for the use of computer-based recording and reporting systems. This resulted in the development and implementation of a computerized program for the calculation of interest in interim financing for the Ministry's investment in water and sewage projects. Improvements were also made in reporting utility capital and operating expenditures.

The Ministry constructs, owns and in most cases, operates water and sewage projects for municipalities. To recover the capital and operating costs a service rate per 1,000 gallons is charged for actual water or sewage treated. During the year 40 rate reviews were conducted out of the 160 completed provincial projects. Due to some large rate increases mostly caused by inflationary pressures, a feasibility study was completed for an automated Utility Rate Information System. This would replace the manual systems and enable the Branch to perform annual rate reviews rather than at two to five year intervals. Development and partial implementation of this program is expected next year.

With The Pollution Abatement Incentive Act being terminated on April 1, 1976, there was increased activity in this area as well as planning for the clean-up of claims which will extend over several years.

## information services branch

The Information Services Branch continued to provide a full range of communication services in fulfilling its responsibility for developing and carrying out communications needs and activities in support of Ministry programs.

The production of more than 75 news releases, in addition to brochures, reports, speeches, audio-visual presentations, promotional materials, posters and advertisements, as well as official openings and exhibitions throughout the Province, brought the Ministry's story, programs and objectives to the public.

Complete media liaison services were provided and press conferences and media interviews were arranged to encourage and promote media coverage of Ministry programs.

Regional information activities accelerated with the Regional Information Services Section and regional and district office staff being involved in media liaison, exhibit and fair activities, public speaking engagements and educational work. Twenty fairs and exhibitions were staged by regional and district offices during the year. In addition, 14 official opening ceremonies for new water treatment and sewage plants were arranged throughout the regions.

In addition to regional fairs, the Branch participated in six major exhibitions. The Ministry's three major displays were seen by an estimated 750,000 people. The Resource Recovery display, complete with a working model of the primary process recycling plant under construction in North York, was used at the Canadian National Exhibition, the Royal Agricultural Winter Fair, and the Western Ontario Exhibition, as well as at the Ontario Science Centre. The Water Quality display, using various laboratory and water quality equipment for demonstration, was shown in Thunder Bay and Ottawa. The new prefabricated Horticultural booth, featuring the work of the Pesticides and Phytotoxicology sections, was used at the CNE and the Flower Show in Toronto.

A more flexible publications program was effected at reduced cost with production of a range of economically produced "Fact Sheets" and a series of brief brochures on various aspects of the environment under the general title: "Who Cares About Our Environment". Publications were up-dated, reprinted and new publications planned. At year's end a total of 65 publications were in circulation, 15 of which were also available to the public in French. Over 1,500,000 Ministry publications were distributed, including technical publications, as well as a vast quantity of litter bags and promotional badges as part of the Ministry's education program.

A public education program, under the Educational Resources Co-ordinator, served Ontario's school system, environmental groups and the general public. Throughout the summer of 1976, the Ministry's "Envirovan" -- a mobile environmental information centre used in educational activities among students of all ages -- travelled the Province, visiting 13 children's camps during July and August. In the evenings the van visited seven provincial camp grounds to explain Ministry programs and show movies with a variety of environmental themes. The van visited over 20 schools in connection with environmental studies, and also took part in several professional development days for teachers.

The Creative Services Section provided graphic and photographic support to the Branch and other branches of the Ministry. Two major slide sound shows concerned with the Cottage Pollution Survey and the Environmental Assessment Program were undertaken, as well as several slide shows produced for educational programs and exhibits. The Section produced a 60-second public service announcement on Industrial Abatement for the use of Ontario TV stations, as well as a 30-second radio public service announcement for the Ministry's Mosquito Control Program. The Section provided extensive photographic evidence and aerial photography work for the Legal Branch, and also graphic and photographic work for brochures and exhibits.

## legal services branch

Staff of Legal Services Branch are employed by the Ministry of the Attorney General and provide legal services on a solicitor and client basis to the Ministry of the Environment.

A major function of the Branch is the conduct of prosecutions under environmental legislation. During the past year there were 44 cases before the courts under The Environmental Protection Act, 12 under The Ontario Water Resources Act and seven under The Pesticides Act with the level of fines ranging up to \$10,000. The Branch screens cases being considered for prosecution, advises on the best methods of gathering and presenting evidence and provides counsel to present these cases in court.

A further major involvement of the Branch is acting as counsel for any director whose decision under a statute is being reviewed in a hearing before the Environmental Appeal Board or other review tribunal. Other legal services include acting as counsel in arbitration hearings under construction contracts, advice on the appropriate application of the Ministry's powers, on the form of documents and a variety of orders which can be issued by directors under the legislation.

The Branch also provides legal advice to the operating branches and prepares Orders-in-Council, regulations, contracts and orders.

## personnel services branch

So far as the staffing function is concerned, the year started with 88 vacancies and ended with 55 positions to be filled. During the year 165 employees left the Ministry and 204 were recruited.

The Branch continued to co-operate with Regional Operations training needs, and increased its delivery of programs for Ministry staff, municipal government and outside agencies. Training highlights included a comprehensive Acoustics Technology Course, Safety and First Aid Courses, and two Gas Chlorination Workshops conducted by the Branch in New Brunswick and Nova Scotia.

In keeping with the Ministry's regionalization commitment, over 300 technical staff were beneficiaries of a new classification with the introduction of the Environmental Technician class series. Classification levels recognized a unified service to Ministry clients as well as more favorable salary levels for the employees.

Environment was a "pilot" ministry for the integrated payroll, personnel, employee benefits system introduced for the first time in the Ontario Government in 1976. The system provides a co-ordinated data base on the full range of compensation information on employees.

## program planning and evaluation branch

The Branch conducts operational and policy evaluation studies relating to Environmental Planning, Environmental Control, Resource Recovery and Administrative Support Services. Its primary goals are to ensure a rational allocation of available resources to programs and to assess program effectiveness and efficiency.

The Branch develops the Multi-Year Plan from conceptual stages to the annual estimates and acts as liaison with Policy and Priorities Board, the Cabinet Committee on Resources Development, Management Board, and other ministries.

Among its accomplishments in 1975-76, was the establishment of Management by Results systems for the Great Lakes Study and for the Municipal and Private Abatement Activity. Considerable improvements were also made to the systems already in use for Air Resources and the construction of water and sewage works.

Reports were completed on Subsidy Programs for Water and Sewage Works in Ontario, Transfer of Responsibility for Water and Sewage Works Construction and Services to Municipalities, and Complement Controls on Utility Management: The Recovery of Administrative Costs of Utility Operations.

A funding system was developed for Health Units administering agreements under Part VII of The Environmental Protection Act.

The Branch was responsible for preparation of the Ministry response to the Recommendations of the Special Program Review Committee. Similarly, following initiation of Supplementary Actions to the 1975 Ontario Budget, the Branch developed and co-ordinated the fiscal economies and reductions in staff complement that were called for by the Government during the remainder of the fiscal year.

## internal audit branch

The Branch was primarily engaged in the performance of fiscal oriented audits, including review of the adequacy of procedures and internal controls. Operational audits were carried out in specific areas and upon request.

With the conversion of the Ministry to the "Integrated Payroll, Personnel and Employee Benefits System", late in the fiscal year, the Branch commenced an in-depth review which will be an on-going program and a major work load in future years. In addition, new audit programs with respect to Regional Offices were in the planning stage for development and testing in the 1976-77 fiscal year.

The Branch continued to review new procedures and proposed controls with staff of other branches.

## boards and commissions

### the environmental hearing board

Chairman: D.S. Caverly

The Environmental Hearing Board, under the authority of The Ontario Water Resources Act and The Environmental Protection Act, this year conducted numerous public hearings in communities where sites were proposed to be used for sewage treatment facilities or for landfill operations. Under the two Acts, it conducted 27 hearings concerned with sewage treatment facilities and 22 hearings regarding sites proposed for landfill operations.

In addition, the Board completed two hearings previously authorized by Order-in-Council. These concerned lead contamination in the Metro Toronto area, and the environmental implications of the Fisher Harbour development. A hearing authorized by Order-in-Council in June 1975 regarding the Ontario Hydro transmission route from near Colbeck to Limehouse was completed. These three hearings dealt with complex and controversial subjects, requiring much more time than usual for the hearing process and the preparation of reports.

In anticipation of the proclamation of The Environmental Assessment Act, 1975, and the appointment of the Environmental Assessment Board to replace the Hearing Board (which occurred April 20, 1976), the Hearing Board and its staff, because of their experience with the requirements of the public hearing process, made preliminary arrangements and prepared prototype notices, forms, and other documents for the use of the Assessment Board. This was done in order that the Assessment Board would be able to conduct the public hearings authorized under The Environmental Assessment Act as soon as they were required.

## the environmental appeal board

Chairman: I.W. Pasternak, Q.C.

During the fiscal year, 36 appeals pursuant to The Ontario Water Resources Act and The Environmental Protection Act, were received by the Environmental Appeal Board. This represents an increase of more than double the number of appeals received during the previous fiscal year and was, in part, a reflection of 1973 amendments to The Environmental Protection Act which allow for the appeal of decisions regarding private sewage systems.

Seventeen appeals were dealt with during 21 days of hearings conducted by the four members of the Board. One hearing of major significance dealt with the Municipality of Metropolitan Toronto appeal from the refusal of the Ministry to approve the Brock North waste disposal site in the Town of Pickering for the disposal of garbage from Metro. The majority of hearings concerned private sewage systems, with appeals regarding waste disposal sites and noise and air pollution matters being less numerous.

## the waste management advisory board

Chairman: R.H. Woolvett

During 1975-76, its first full year of operation, the Waste Management Advisory Board launched a number of activities directed at fulfilling its broad mandate of advising the Minister of the Environment on any matter related to the management of waste in Ontario.

The Board has been particularly interested in ensuring that it obtains information from as many sources as possible to assist it in receiving and analysing the viewpoints of all sections of the community. With this policy in mind, it has met



with representatives from industries involved in the Board's areas of interest, with municipal officials, research bodies, consumers' associations and citizens' groups on many occasions.

An important area of Board effort during this time concerned carbonated soft drink containers. The Board carried out a monitoring program to determine the availability of refillable containers for carbonated soft drinks; held on-going discussions with container and soft drink manufacturers and retailers to encourage their co-operation in achieving the objective, and carried out a study to examine the problems of float equity, as they apply to the use of standard refillable bottles. In March 1976, the Board submitted a report to the Minister, entitled "The Carbonated Soft Drink Container in Ontario."

Further, in the soft drink area, the Board recommended to the Minister, in August 1975, that single-use containers for carbonated soft drinks manufactured of plastic or aluminum or glass (larger than 1.5 litres) not be allowed for sale in Ontario without prior approval from the Ministry of the Environment. This recommendation was adopted and embodied within Regulation 998/75, under The Environmental Protection Act, 1971. This Regulation became effective on January 1, 1976.

In other beverage container areas, Board activities include studies into milk packaging and wine and spirits packaging. In February 1976, an interim milk packaging report was submitted to the Minister, containing data on current use patterns and market trends for fluid milk containers in the Province. It also contained a Board recommendation to encourage the continued use of the three-quart refillable milk jug. Research into wine and spirits packaging was still in hand at the end of the fiscal year.

The dearth of reliable information across the Province on the quantities of municipal waste generated and its composition was recognized by the Board as being a hindrance to the fulfilling of many of its functions. As outlined in its terms of reference, these functions include: "reporting to the Minister on the effect of government directives and regulations imposed to achieve a reduction in the generation of solid waste," and "examining the priorities which should be allotted to programs of research and development, related to the reduction of waste and to resource recovery from waste." Accordingly, the Board undertook to develop reliable per capita generation figures for residential, commercial and industrial wastes collected and

disposed of by municipalities and private agencies through the Province. It also undertook to obtain an approximation of the composition of waste being generated at the residential level. This study was still in hand at the end of the fiscal year.

Other Board activities initiated during this time period included a literature search concerning glass markets; discussions with Environment Canada and the Ministry of Industry and Tourism, regarding the development of an industrial waste materials exchange program; and research into residential separation-at-source techniques.

## the pesticides advisory committee

Chairman: Dr. D.N. Huntley

The Committee, established in 1970 under The Pesticides Act, reviews annually the content and operations of The Pesticides Act, inquires into matters concerning pesticides and the control of pests, and reviews publications of the Ontario Government about pesticides and pest control, and reports thereon to the Minister of the Environment.

Mr. Keith Laver, Chairman of the Committee since its inception, resigned in February 1976 and was succeeded by Dr. D.N. Huntley. The Committee consisted of 13 members drawn from agriculture, industry, universities and government.

The Committee reviewed the characteristics of 241 new pesticide products and recommended for each a classification for storage, sale and use in Ontario.

All the 1975-76 publications of the Ministries of Agriculture and Food, Environment and Natural Resources, concerned with pesticides, were reviewed prior to printing and distribution.

A report by the Committee on the availability and dependability of personal protective equipment for pesticide users was published in 1975 and received wide distribution through the Pesticides Control Section.

The Committee reviewed 37 research project proposals from universities and recommended that the Ministry fund 22 projects at a total cost of \$136,017.

In 1975-76 OPAC held 21 full committee meetings as well as numerous subcommittee meetings involving particular members. In all, about 500 man days of work was expended.

## the pesticides appeal board

Chairman: J.R. Swanborough

During 1975-76, six appeals were received by the Pesticides Appeal Board and two hearings were held. Since most of the appeals were received near the end of the fiscal year, they were scheduled for the following year.

## the farm pollution advisory committee

Chairman: Otto Crone

The Farm Pollution Advisory Committee is comprised of four Ontario farmers, Otto Crone and Harold Eubank of Hagersville, Donald Switzer of Smithville and John Peart of Caledonia. Its primary concern is to provide objective assessments of farm environmental situations. When requested by Ministry officials, the Committee visits farms to make recommendations to the farmers about normal farm procedures, for example, manure storage, spreading and cultivation, drainage of yards and ventilation of livestock and poultry buildings.

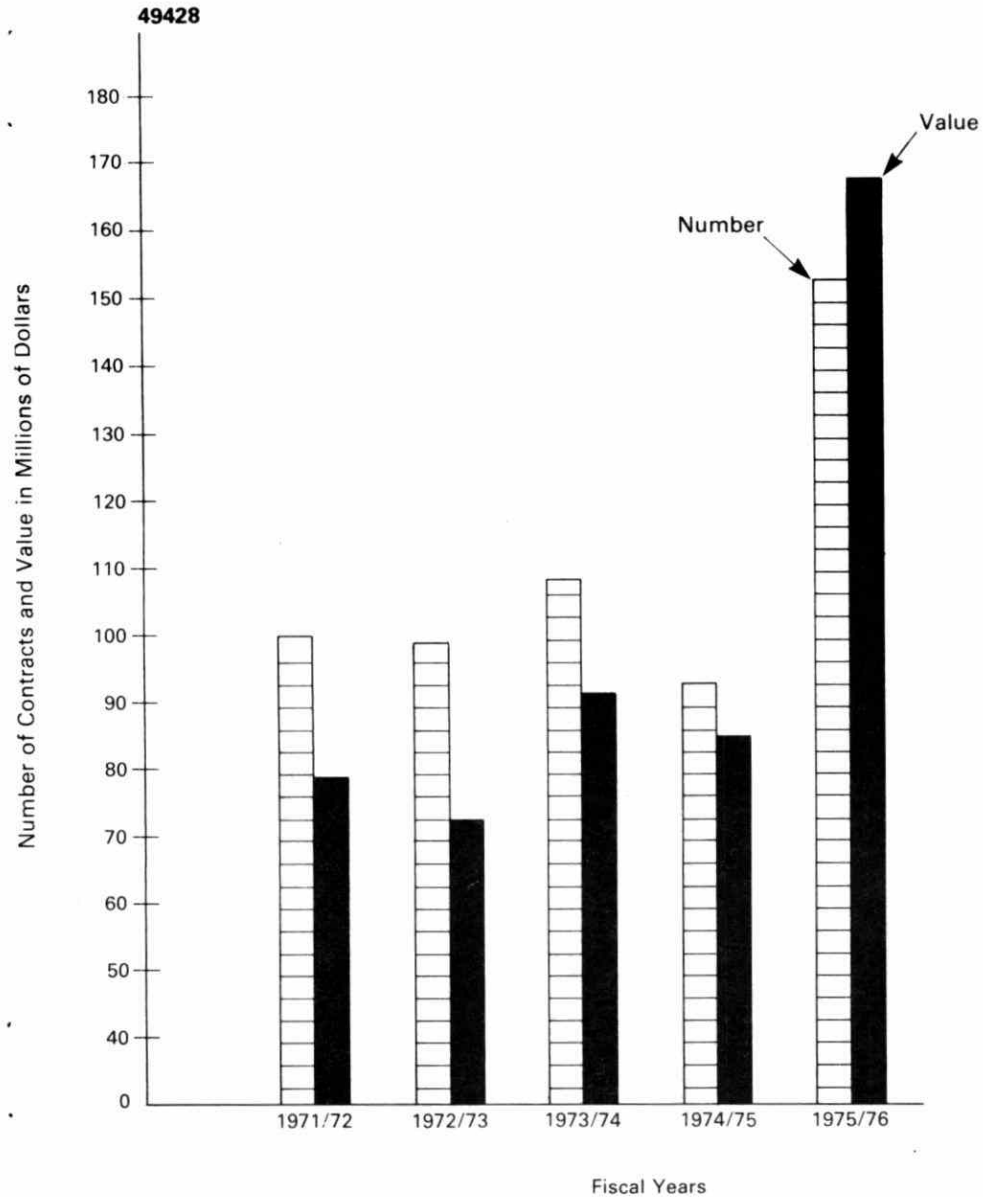
As residential growth encroaches upon existing farms, complaints by area residents about farm odours increase: those not settled by Ministry officials are referred to the committee, which in nearly all cases has found a solution acceptable to both parties.

In 1975-76, five farms were visited at the request of the Ministry. Two were judged to be operating in a satisfactory manner: the other three received recommendations regarding manure storage and dead stock disposal. The Committee files a report on each visit. Recommendations of the Committee are delivered to the farmer through the Ministry.

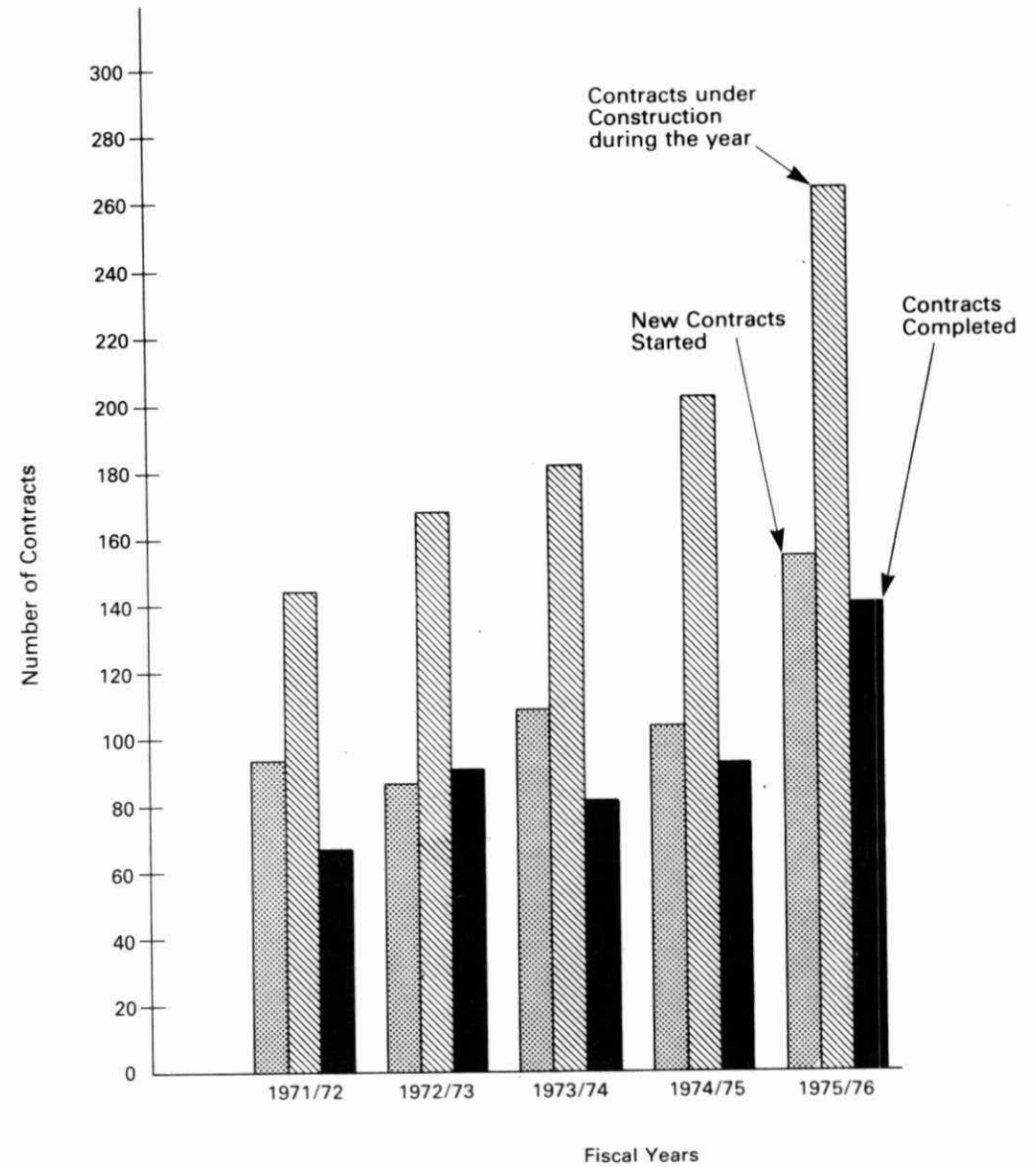
NUMBER AND VALUE OF CONTRACTS TENDERED ANNUALLY  
(1971/72 to 1976/77)

# APPENDICES

ANNUAL VOLUME OF ACTIVITY  
(1971/72 — 1976/77)

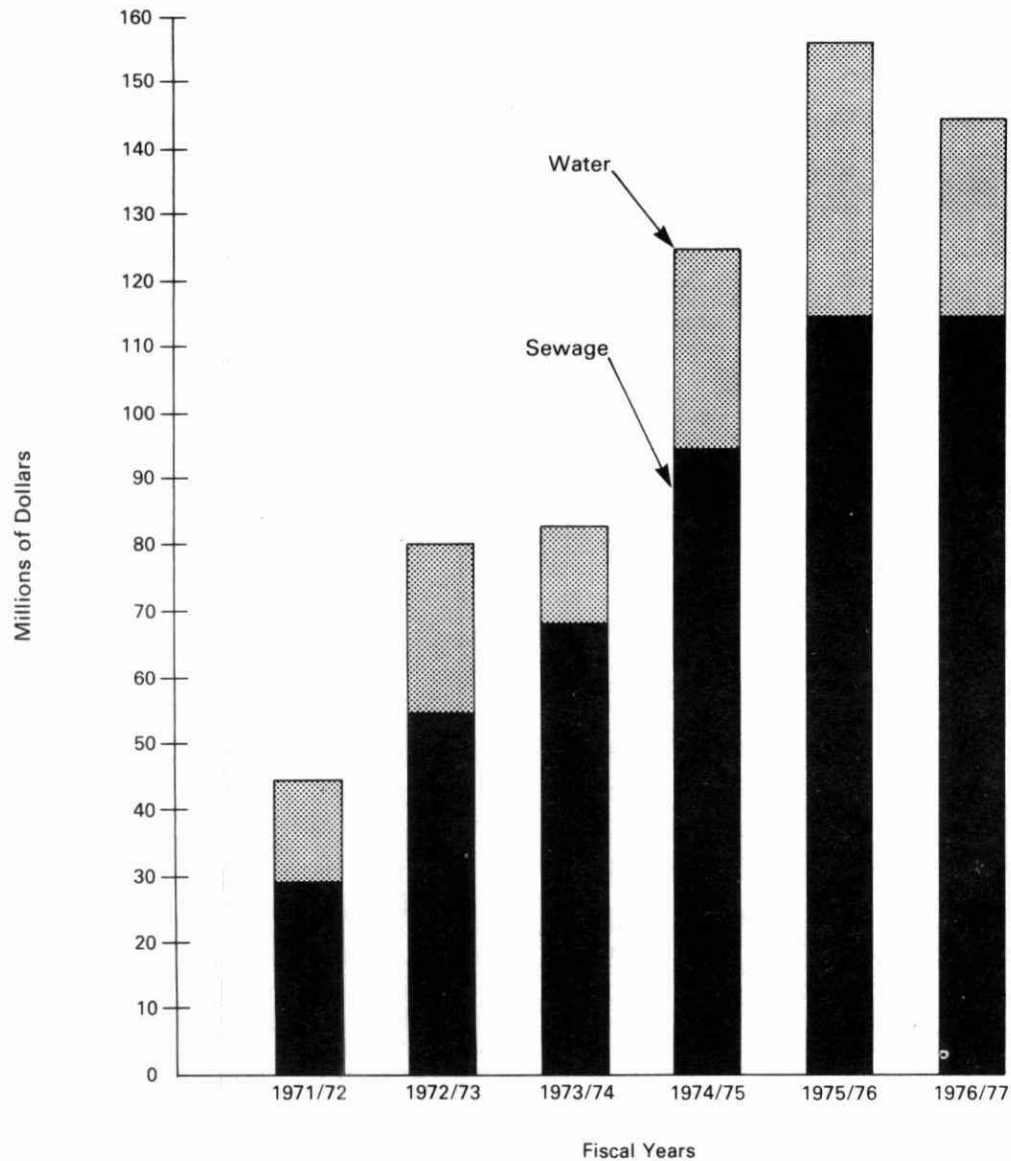


GRAPH I



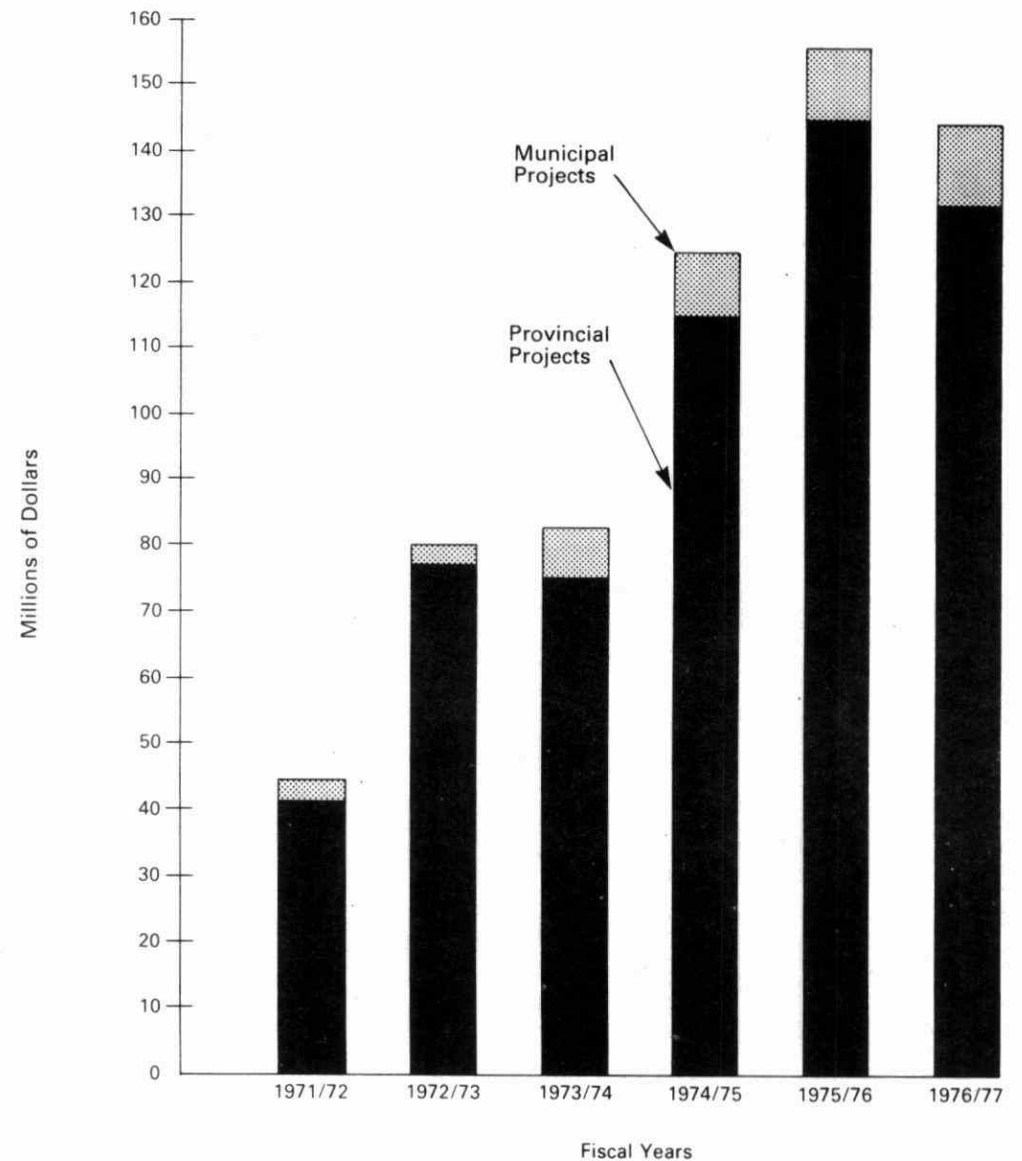
GRAPH II

**ANNUAL TOTAL EXPENDITURE BY PROJECT TYPE**  
(1971/72 — 1976/77)



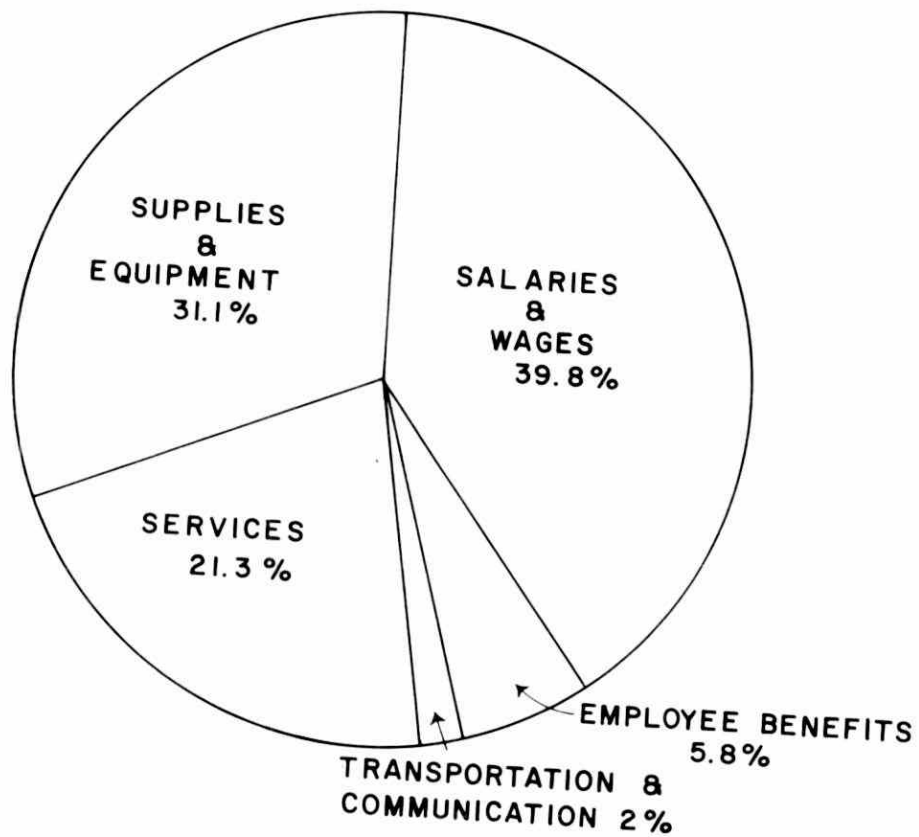
GRAPH III

**ANNUAL TOTAL EXPENDITURE BY CLASS**  
Capital Construction Program  
(1971/72 — 1976/77)



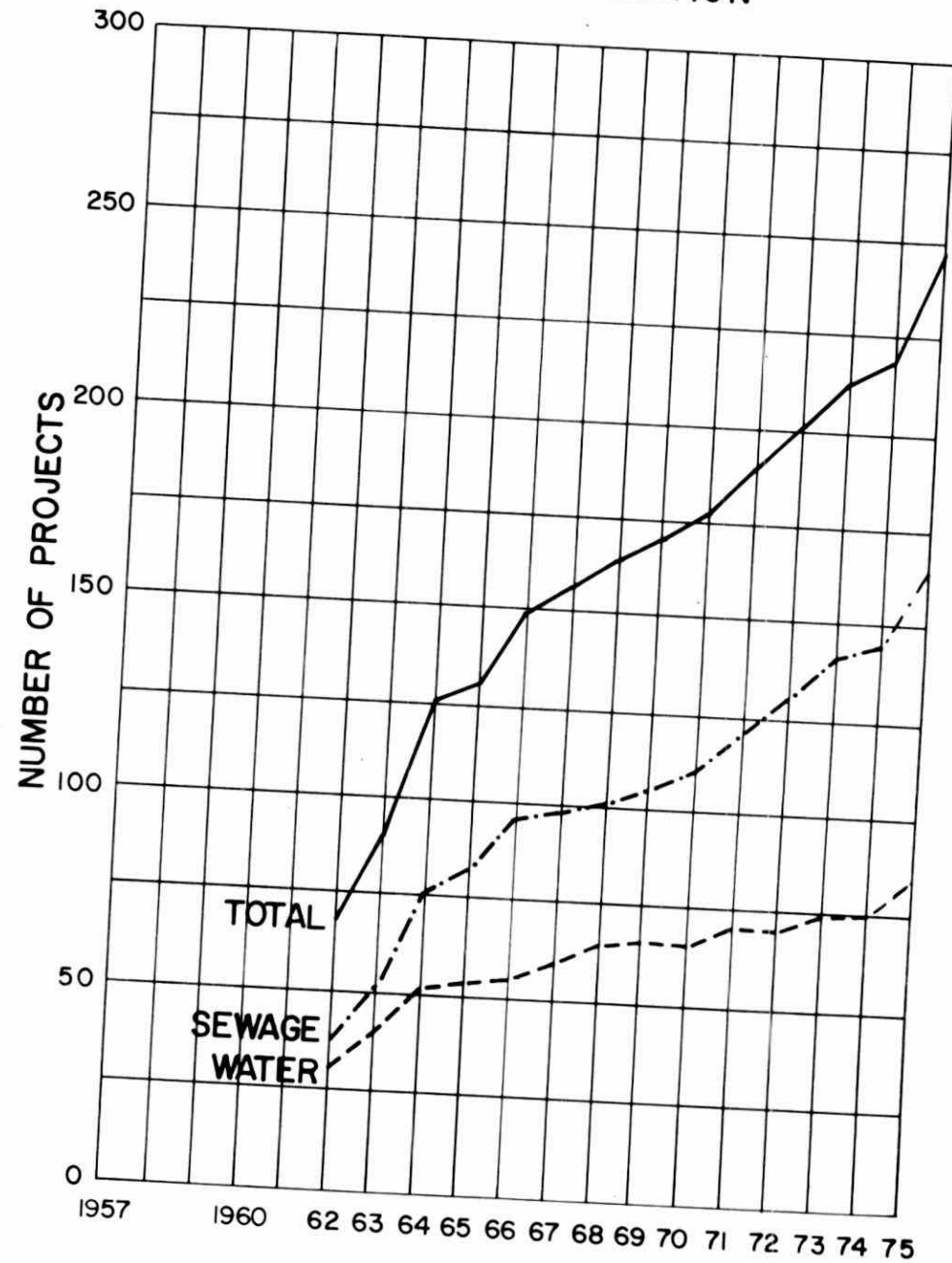
GRAPH IV

# DISTRIBUTION OF OPERATING COSTS FISCAL YEAR 1975-76



GRAPH V

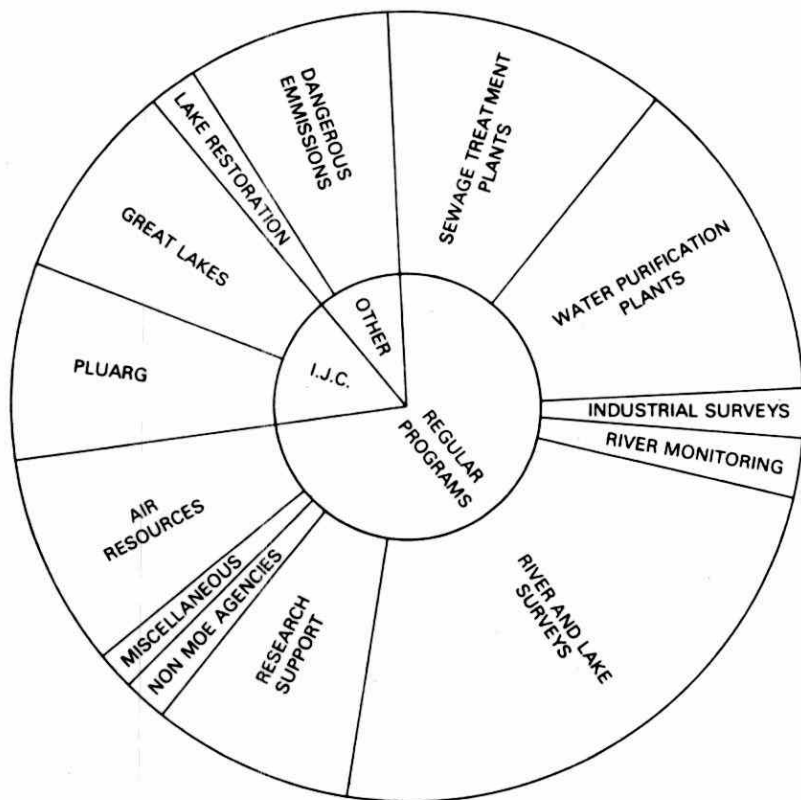
# PROJECTS IN OPERATION



GRAPH VI

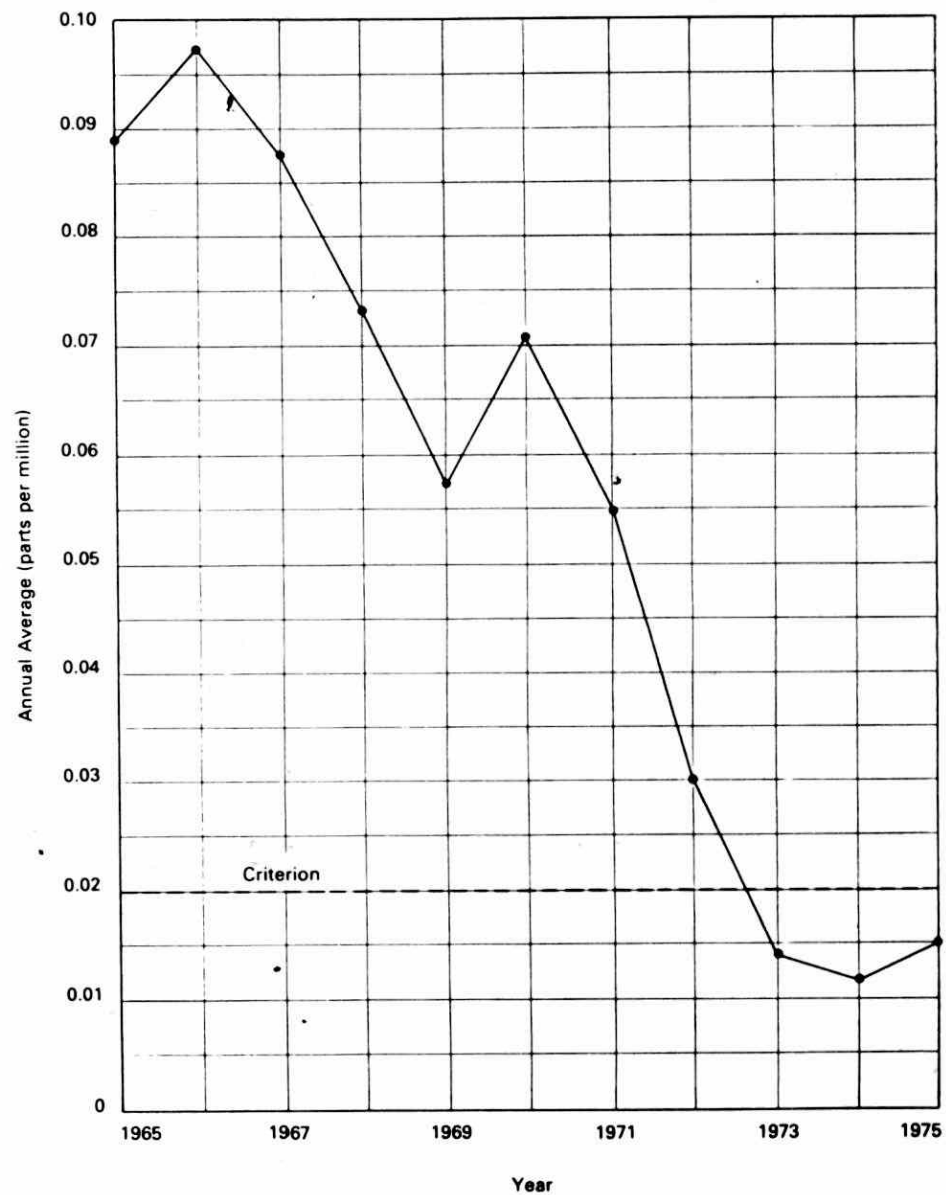


TEST DISTRIBUTION BY PROGRAMS



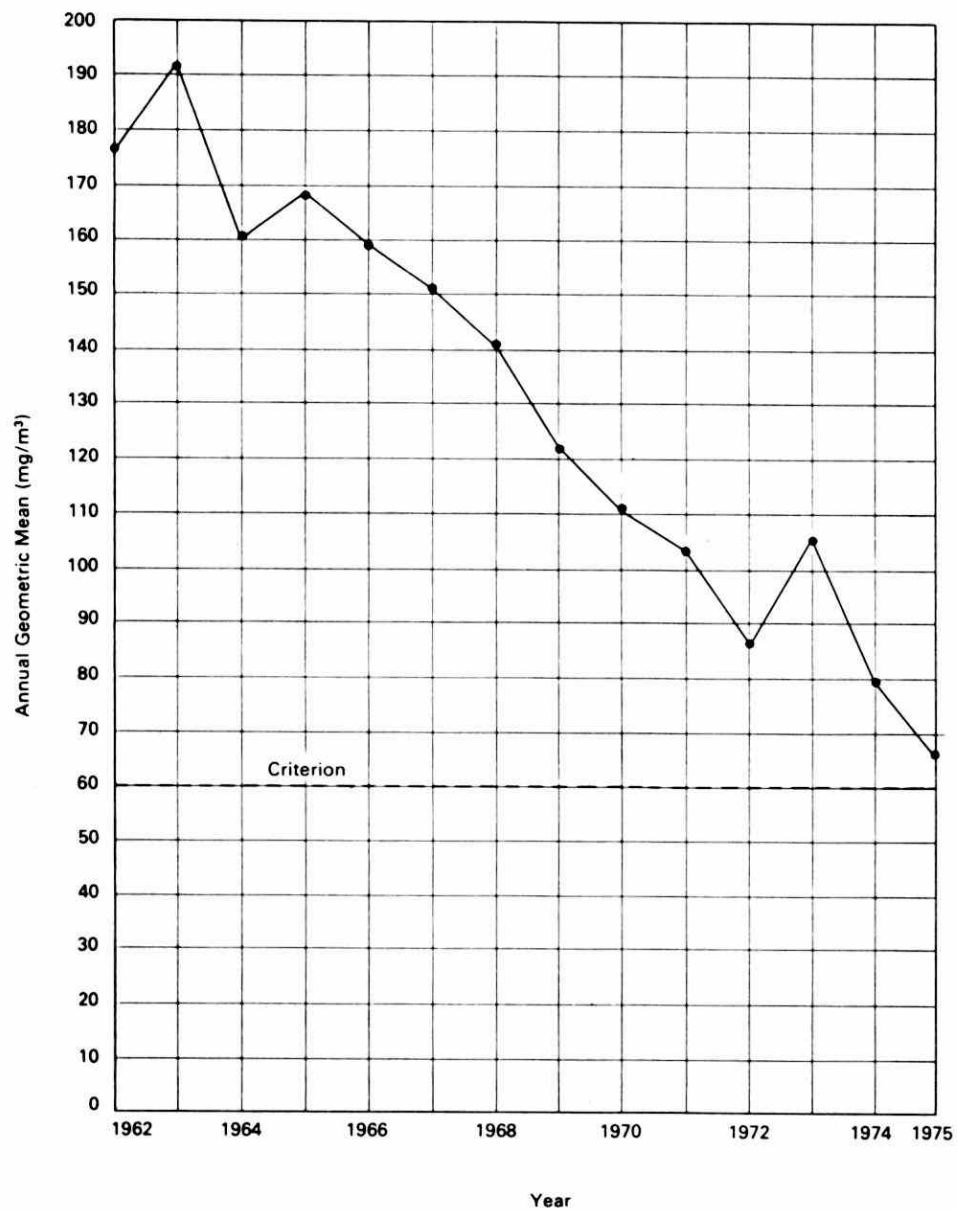
GRAPH VII

SULPHUR DIOXIDE IN DOWNTOWN TORONTO



GRAPH VIII

# SUSPENDED PARTICULATE IN DOWNTOWN TORONTO



GRAPH IX

TABLE I

## INDUSTRIAL APPROVALS SECTION

### Applications for Approval Processed

1975-76

(To March 31, 1976)

	<u>Received</u>	<u>Approved</u>	<u>Cancelled</u>	<u>Denied</u>
Air	688	686	54	5
Water	108	111	9	-
Waste	<u>126</u>	<u>120</u>	<u>2</u>	<u>-</u>
Total	922	917	65	5

TABLE II

## PROJECT CO-ORDINATION BRANCH

The volume of activity of the Capital Construction Program during the 1975-76 fiscal year is indicated by the following statistics:

1) Capital Expenditure	\$ 154,939,000
Sewage Works	\$ 114,783,000
Water Works	\$ 40,156,000
Provincial Projects	\$ 145,206,000
Municipal Projects	\$ 9,733,000
Provincial Subsidy	\$ 62,800,000
Ditto. as % of total expenditure	% 40.5

2) New Projects									
Provincial Projects									
New Applications Received								18	
Final Agreements Executed								24	
Municipal Projects									
New Applications Received								10	
Preliminary Agreements Executed								7	
Final Agreements Executed								12	
3) Construction									
Contracts Tendered	- No.							153	
	\$ Value							\$ 167,520,000	
Contracts Started	- No.							153	
	\$ Value							\$ 169,047,000	
Contracts Completed	- No.							139	
	\$ Value							\$ 110,291,000	
Contracts Under Construction During the Year								262	
Average number of Contracts Under Construction in each month								127	
4) Grants to Regional and Restructured Municipalities									
No. of Municipalities Participating								14	
Value of Grants Paid								\$ 10,429,000	

TABLE III

MINISTRY OF THE ENVIRONMENT  
SUMMARY OF INDUSTRIAL ABATEMENT ACTIVITIES  
FOR THE FISCAL YEAR 1975-76

	North West	North East	South West	South East	Central	West Central	Total 75/76	Total 74/75	% Diff.
Number of Complaints	218	369	1,081	540	3,317	1,218	6,743	7,642	-11.8
Control & Ammending Control Orders	4	1	3	0	8	11	27	27	0
Program Approvals	2	1	2	0	1	6	12	18	-50
Ministry Order-API	0	0	0	0	17	0	17	16	+ 6.25
Farm Visits									
Certificate for Compliance Program	1	0	342	50	107	184	684	498	+37.4
Spills	37	299	135	112	221	108	912	719	+26.8
Court Cases	0	0	2	2	13	7	24	40	-40
<b>COMPLAINTS</b>									
Odour	64	121	353	182	1,466	613	2,799	2,948	- 5.
Smoke	30	79	171	87	1,032	152	1,551	1,977	-19.1
Particulate/dust	83	65	264	108	523	239	1,282	1,593	-19.5
Agricultural	2	0	104	26	29	42	203	250	-18.8
Noise	17	28	97	57	22	31	252	256	- 1.6
Water	10	57	71	73	193	50	454	431	+ 5.3
Other	12	19	21	7	52	94	205	247	-17.
						TOTAL	6,746	7,642	-11.7
<b>CAPITAL COSTS</b>									
\$MM	46	29.5	38	11.3	20.8	31.9	177.5	142	+25.

TABLE IV  
LABORATORY SERVICES BRANCH  
NUMBER OF TESTS PERFORMED

Laboratory Unit	Tests x 1,000		% Increase	Remarks
	1974-75	1975-76		
London Regional Lab.	157.5	209.0	32.7	Regional Labs. up 41%
Thunder Bay Regional Lab.	74.7	91.1	22.0	
Kingston Regional Lab.	32.7	73.3	124.2	
Water Quality Section	737.6	816.5	10.7	
ITC Section	94.3	141.8	50.4	
OTC Section	23.2	49.9	115.1	
Air Quality Section	131.9	122.3	- 7.3	
Microbiology Section	165.6	179.0	8.1	
LABORATORY SERVICES BRANCH TOTAL	1,417.5	1,682.9	18.8	

TABLE V  
LABORATORY SERVICES BRANCH  
WORKLOAD BY PROGRAMS

Program	Tests x 1,000		% Change	% of Total Load	
	1974-75	1975-76		1974-75	1975-76
Utilities - STP	141.9	184.1	29.74	10.0	10.9
Utilities - WW	176.2	225.7	28.1	12.4	13.4
Industrial Surveys	31.7	59.2	86.7	2.3	3.5
River Monitoring	124.0	120.1	-31	8.7	7.2
River & Lake Surveys	175.0	297.4	69.9	12.4	17.7
Research Support	162.5	132.4	-18.5	11.6	7.9
Non MOE Agencies	33.3	45.1	35.4	2.3	2.7
Misc. Reg. Programs	14.2	32.1	126.1	1.0	1.9
Air Resources Branch	137.5	134.4	- 2.3	9.7	8.0
IJC - PLUARG	30.1	128.7	327.6	2.1	7.6
- Great Lakes	224.6	141.6	-37.0	15.8	8.4
Lake Restoration	73.8	35.3	-52.2	5.2	2.1
Dangerous Emissions	92.7	146.8	58.4	6.5	8.7
ALL PROGRAMS	1,417.5	1,682.9	18.8	100	100

TABLE VI  
TORONTO AIR POLLUTION INDEX LEVELS

YEAR	Number of Occasions Exceeding		Maximum Level and Date
	Maximum Desirable Level	First Alert Level	
	32	50	
1970*	17	2	56 Oct. 8
1971	19	1	52 Apr. 13
1972	2	Nil	45 Feb. 13
1973	3	Nil	43 Oct. 24
1974	3	1	50 Oct. 29
1975	2	1	62 Nov. 20

\*Started March 23, 1970

TABLE VI  
FINANCIAL SERVICES BRANCH  
TABLE OF GRANTS  
UNDER THE POLLUTION ABATEMENT INCENTIVE ACT

Fiscal Year	Appropriation	Actual	
		Claims	Amount
1970/71	statutory	164	\$ 413,881
1971/72	2,000,000	559	1,944,889
1972/73	2,750,000	176	2,307,076
1973/74	3,750,000	249	1,571,963
1974/75	2,750,000	517	2,749,389
1975/76	3,250,000	564	3,242,125
		2299	
TOTAL ESTIMATED GRANTS FOR POLLUTION ABATEMENT			\$12,229,323



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**MOE**  
**STANDARDS DEVELOPMENT BRANCH**  
**LIBRARY**

**HC**  
**120**  
**.E5**  
**O57**  
**1975/7**

Ministry of the environment  
annual report 1975-76.  
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